LWS 515 / SOIL 515 – WATERSHED SCIENCE

TERM 1 – Sept – Dec 2020

ACKNOWLEDGEMENT

UBC's Point Grey Campus is located on the traditional, ancestral, and unceded territory of the xwməθkwəy̓əm (Musqueam) people. The land it is situated on has always been a place of learning for the Musqueam people, who for millennia have passed on their culture, history, and traditions from one generation to the next on this site.

COURSE INFORMATION

Course Title	Course Code Number	Credit Value
Watershed Science	LWS 515 / SOIL 515	3

PREREQUISITES

CONTACTS

Instructional Team		Contact Details	Office Location	Office Hours
Instructor	Sandra Brown	sandra.brown@ubc.ca	McMl 229	via zoom time: t.b.a.

COURSE INSTRUCTOR BIOGRAPHICAL STATEMENT

I am an Assistant Professor of Teaching in in the Faculty of Land and Food Systems at UBC Vancouver campus. I am a geographer, with expertise in soil and water resources, and a specific focus on international development. My research interests include characterization of human impacts on soil and water resources. You can find out more at http://www.landfood.ubc.ca/person/sandra-brown/ or follow me on twitter @SandraBrownSoil

WHY STUDY WATERSHED SCIENCE?

Watersheds are effective integrators of environmental processes - combining inherent conditions, the cumulative impacts of land use, and water management to determine the water flow and water quality conditions upon which humans and ecosystems depend. This course presents a comprehensive overview of watershed science, and the principles of integrated watershed management.

COURSE STRUCTURE – BLENDED

Year/Term: Winter 2020-2021, Term 1

Course Schedule: **Wednesdays 4:30 - 6:00 p.m. Vancouver time –** synchronous

Class location: Synchronous class in Zoom (link via course Canvas site)
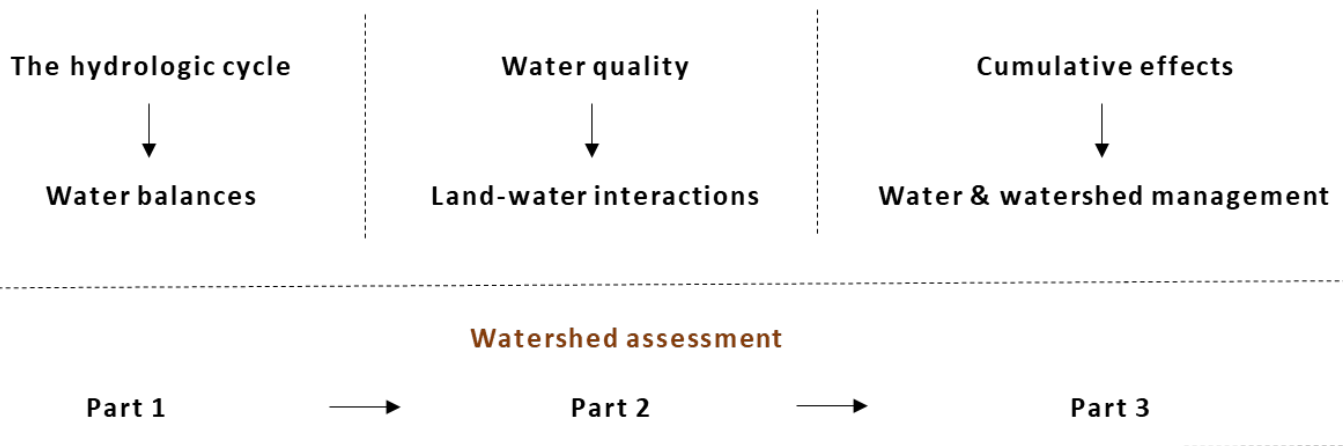
This course will be taught using a modular format. We will focus on six core areas: the hydrologic cycle, water balances, water quality, land-water interactions, cumulative effects, and water and watershed management (see the course map below).

Wednesday tutorial is required – this will be our live virtual classes; and will include a mix of short presentations, break-out groups, and discussion sessions covering core theory and its application.

Materials to review prior to class will be organized by module and provided in Canvas following the course schedule. The blended approach implies you will need to undertake self-directed learning; this includes individual assignments and asynchronous group activities throughout the term.

LWS 515 / SOIL 515 COURSE MAP

SCHEDULE OF TOPICS

Any changes to the schedule will be announced on Canvas. Please be sure you are receiving Canvas announcements for this course.

Schedule	Topic	Tutorial	Due Dates
Sept 9-13	Introduction – water & watersheds	Sept 9	*Honesty pledge* - Sept 13
Sept 14-20	1. The hydrologic cycle	Sep 16	*Review paper 1* - Sept 15
Sept 21-27	2. Water balance	Sep 23	*Review paper 2* - Sept 22
Sept 28-Oct 4	Working session – data sources	Sep 30	
Oct 5-11	Working session – precipitation and hydrologic variability	Oct 7	*Watershed Assessment report I -* Oct 11
Oct 12-18	3. Water quality	Oct 14	*Review paper 3* Oct 13
Oct 19-25	4. Land-water interactions	Oct 21	*Review paper 4* Oct 20
Oct 26-Nov 1	Working session – water quality indicators	Oct 28	
Nov 2-8	Mini-presentation: Natural vs anthropogenic impacts, the case study of the Sumas watershed	Nov 4	*Watershed Assessment report II* - Nov 3
Nov 9-15	5. Cumulative effects	Nov 11 – no class *Remembrance day*	*Review paper 5* Nov 10
Nov 16-22	6. Water & watershed management	Nov 18	*Review paper 6* Nov 17
Nov 23-29	Working session -	Nov 25	
Nov 30-Dec 3	Final presentations - watershed projects	Dec 2	*Student presentations* – Dec 2 *Watershed Assessment report II* – Dec 6

LEARNING OUTCOMES

Upon completion of LWS/SOIL 515 successful students will be able to:

1. characterize the components of watersheds
2. describe the framework of watershed-based evaluations
3. investigate links between land use activities, their interactions and impacts on water resources
4. discuss approaches to deal with complexity, integration and cumulative effects
5. articulate the importance of community-based approaches to watershed management
6. undertake a watershed assessment
7. develop potential management options to address societal challenges around water resources in a watershed context

The course is not intended to cover all aspects of hydrology, water chemistry or aquatic health but will provide an overview of each topic and illustrate the major interrelationships between them and land use activities. At the end of the course, you will have an understanding of the consequences of the main human activities on water resources, be able to examine the health of a watershed, diagnose potential causes, and make suggestions of options and policies on how to improve the watershed system.

LEARNING MATERIALS

Teaching Technology:

The UBC *Canvas* learning management system will be used throughout the course for course communication, assignment submission, grading etc.. Please see here for a student guide to using Canvas and for Canvas related technical support.

Zoom will be used for virtual classes and break-out sessions. Links will be posted in Canvas.

Please do not email the instructor or the TA for technical support issues. We cannot solve these issues and this will only further delay your efforts. Please DO let us know if something is missing or not working properly on the Canvas course site – this may be something we can fix and will help us resolve the issue for all class members.

Readings:

Readings are organized by module and posted in Canvas. Suggested readings for review papers are provided to help you get started on your assignments, but as a graduate student, you are expected to independently review additional, relevant literature.

LEARNING ACTIVITIES & ASSESSMENT OF LEARNING

Assignments	Weight	Associated Learning Outcomes
Review papers (n=6)	45%	1,4,5
Watershed assessment reports (n=3)	45%	2,3,6,7
Participation - discussions + final presentation	10%	1, 3, 5

Assignments:

Review papers: There are 6 short (500 word) review papers focused key topics covered in the course. These thematic short papers draw from both the course readings and external literature sources. Due dates will be posted in Canvas. Topics include hydrology, water balance, water quality, land-water interactions, cumulative effects and water management.

Watershed Reports: There are 3 reports in this course which combined cover the major components of a watershed assessment and an initial assessment of potential management options. These reports are project oriented, building on concepts covered in the course readings and tutorial sessions. Due dates and details will be posted in Canvas.

Submission of assignments*:* all assignments are to be submitted online in Canvas in word (doc or docx), pdf or pptx formats only. If your file does not open, I will consider the assignment as not submitted.

Late assignments: Assignments must be uploaded to Canvas prior to the due date. Review papers will be discussed in-class, therefore no late assignments will be accepted. Watershed reports submitted beyond the due date will be subject to a -10% per day (including weekend days) late penalty, maximum 4 days.

If you are having trouble meeting an assignment deadline, please let me know as soon as possible; I can work with you and your grad advising office to come up with a plan to fulfill course requirements should you have documented medical or other extenuating circumstances.

Retention of assignments: Students should retain a copy of all submitted assignments (in case of loss).

Exams: There are no exams in this course.

Participation: will be based on peer-to-peer discussion sessions during tutorial, group and individual presentations, including presentation of your final watershed assessment (as per the course schedule).

Grading guidelines: see http://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,42,96,0

Percentage (%)	Letter Grade	Percentage (%)	Letter Grade
90-100	A+	85-89	A
80-84	A-	76-79	B+
72-75	B	68-71	B-
64-67	C+	60-63	C
0-59	F (Fail)		

Note: only 6 credits of courses with grades in the C to C+ range (60-67%) may be counted toward a master's program. For all other courses, a minimum of 68% must be obtained.

HOW TO GET HELP

There are two main platforms for you to get help with course content. 1) Wednesday tutorials 4:30 to 6:00 p.m. and 2) Post your questions to the Canvas discussion forum.

UNIVERSITY POLICIES

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access, including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions. Details of the policies and how to access support are available on the UBC Senate website.

During this pandemic, the shift to online learning has greatly altered teaching and studying at UBC, including changes to health and safety considerations. Keep in mind that some UBC courses might cover topics that are censored or considered illegal by non-Canadian governments. This may include, but is not limited to, human rights, representative government, defamation, obscenity, gender or sexuality, and historical or current geopolitical controversies. If you are a student living abroad, you will be subject to the laws of your local jurisdiction, and your local authorities might limit your access to course material or take punitive action against you. UBC is strongly committed to academic freedom, but has no control over foreign authorities (please visit http://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,33,86,0 for an articulation of the values of the University conveyed in the Senate Statement on Academic Freedom). Thus, we recognize that students will have legitimate reason to exercise caution in studying certain subjects. If you have concerns regarding your personal situation, consider postponing taking a course with manifest risks, until you are back on campus or reach out to your academic advisor to find substitute courses. For further information and support, please visit: https://academic.ubc.ca/support-resources/freedom-expression

OTHER COURSE POLICIES

Academic Integrity:

Academic honesty is a core value of scholarship; all students are expected to know, understand and follow the codes of conduct regarding academic integrity. At the most basic level, this means submitting only original work done by you, and acknowledging all sources of information or ideas and attributing them to others as required. This also means you should not cheat, copy, present the work of others as your own, or self-plagiarize. Violations of academic integrity (i.e., misconduct) are taken very seriously at UBC, and harsh sanctions are imposed. Incidences of plagiarism or cheating may result in a mark of zero on an assignment, and more serious consequences may apply when the matter is referred to the Office of the Dean. Careful records are kept in order to monitor and prevent recurrences. A more detailed description of academic integrity, including the University's policies and procedures, may be found in the UBC Calendar: Student Conduct and Discipline. Please speak with me if you are unsure about these policies so that I can clarify them for you.

Early Alert:
During the term, I will do my best to reach out and offer support if I am concerned about your academic performance or wellbeing. I also encourage you to come and speak with me, or with student services, if you need assistance. In addition, I may identify my concerns using Early Alert. The program is confidential and provides you with connection to resources such as academic advising, financial advising, counseling, or other resources and support to help you get back on track. For more information, please visit earlyalert.ubc.ca.

Academic Concession:
For the first occurrence of an acute illness (cold, flu or other) or compassionate grounds, a *self-declaration* will suffice. To request academic concession, please email me prior to the due date. A doctor's note is NOT required for this request. If you have an ongoing issue including: conflicting responsibilities, medical circumstance, or compassionate ground (e.g. death in the family) please contact your Faculty's advising office for guidance.

Once academic concession is granted, the weight of the missed assignment will be redistributed to the other course items of the same type.

*If you or one of your family members has the **COVID-19** virus, please contact Student Services immediately, so that we can explore concessions (if needed) that will not impact your grades negatively.*

Assignment regrades / course standing:
If you notice a potential grading error on an assignment, please notify me (email or Canvas mail) as soon as possible.

To request a review of your final standing you must apply for a Review of Assigned Standing. Information on this process is found in the UBC Calendar.

LEARNING ANALYTICS

Learning analytics includes the collection and analysis of data about learners to improve teaching and learning. This course will be using the following learning technologies: Canvas, Zoom, django. Many of these tools capture data about your activity and provide information that can be used to improve the quality of teaching and learning. In this course, I plan to use analytics data to:
- View overall class progress
- Track your progress in order to provide you with personalized feedback
- Review statistics on course content being accessed to support improvements in the course
- Assess your participation in the course

COPYRIGHT

All materials of this course (course handouts, lecture slides, assessments, course readings, etc.) are the intellectual property of the Course Instructor or licensed to be used in this course by the copyright owner. Redistribution of these materials by any means without permission of the copyright holder(s) constitutes a breach of copyright and may lead to academic discipline.

I do not permit students to record my classes without prior approval.

Version: Sept 4, 2020

GUIDELINES FOR REVIEW PAPERS

Review papers will include two parts: 1) a general topic assigned to all students and 2) the opportunity to research a sub-topic of interest (selected from a list of 4 themes). Details for each review paper will be provided in Canvas.

General guidelines:

- Maximum 500 words (not including references, tables, figures)
    - Include tables and/or figures as appropriate to support your discussion
    - -10% deduction for exceeding the word count
- Reports must be written in your own words
    - We encourage group work, sharing of resources and/or ideas
    - But reports must be written independently
- Six topics in total; assigned 1 week prior to due date (see course schedule)

Paper format

- Use <u>subheadings</u> to indicate what specific question(s) you are responding to
    - e.g. Paper 1 on the hydrologic cycle would have two subheadings
- When defining <u>terms</u>, consider including both a definition and a brief discussion of it's importance
- Provide sufficient information to <u>support your rationale</u>, e.g. if you are asked how something might change, provide information on why (and support your rationale with literature); if you are asked what (e.g. what are the main factors), do not simply provide a list, but <u>describe and discuss</u> the importance of each factor.
- Provide <u>citations</u> within the text (e.g. Brown, 2017) and a list of references (including referee journal articles, textbooks and internet sources). Review papers should include a minimum of 5 references, use of secondary information sources (e.g. textbooks) is acceptable, include refereed journal articles where you can, most literature cited should be current (i.e. last 10 years). Consider the credibility of online resources, and provide the url within your list of references.

Grading

- 80% based on content
- 10% layout, structure, logical flow, writing style, grammar, spelling (readability)
- 5% references
- 5% graphics, figures, tables

GUIDELINES FOR WATERSHED ASSESSMENT REPORTS

- Maximum 1,500 words excluding figures, tables and references
- Specifics for each report provided in Canvas
- Reports must be written in your own words
- 3 assessment reports in total; see Canvas for details and due dates

Generic grading rubric[1] for watershed reports:

	Excellent	Good	Satisfactory	Unsatisfactory
Problem statement / topic focus (5%)	Introduction clearly and concisely outlines the topic and why it is important	Introduction outlines the topic and its importance	Introduction outlines the topic; relevance unclear	Topic not clearly defined
Depth of content / discussion (50%)	In-depth discussion and elaboration of relevant soil concepts and processes	Demonstrates knowledge of soil concepts	Omission of some pertinent content	Cursory discussion, lacks depth, missing key soil concepts
Integration of knowledge (30%)	Integrates concepts, synthesis of ideas; recognizes complexity	Integrates concepts, synthesis of ideas	Partial synthesis of ideas; inter-relationships not fully developed	Lacks integration
Summary (5%)	Concluding remarks explore implications	Some conclusions not supported	Conclusions not fully documented	Cursory or repetitive
Organization / structure / grammar (5%)	Well written report, flows logically, concepts linked; minimal grammar or spelling errors	Well written report, logical structure, minimal grammar or spelling errors	Well written report, lacks flows, some grammatical errors	Report unorganized, difficult to read; many grammatical / spelling errors
Sources (5%)	Well referenced (15+ citations); 5+ references from refereed journal articles; 5+ current sources[2]	Good blend of references including journal articles; 10+ references cited; most references recent	Reliance on textbook or limited journal article citations; 5-10 references listed; many dated references (more than 10 years out of date)	Lacked sufficient references; reliance on textbook or internet sources[3]; limited use of journal articles

- [1] Outlines for specific reports will be provided in Canvas
- [2] Current sources published within last 10 years
- [3] Internet sources for refereed journal articles or relevant reports is acceptable; consider the credibility of online sources

GUIDELINES FOR FINAL PRESENTATIONS

Final group presentations on your watershed project will take place at the end of term. Presentations will be 5-7 minute in length, followed by 3-4 minutes of questions. Briefly outline the water quantity and water quality issues in your watershed – show us your key data graphs or tables, and present one management option to potentially address your priority issue.

Grading rubric for SOIL 515 / LWS 515 presentations:

	Excellent	Good	Satisfactory	Unsatisfactory
Visuals / slides (20%)	Clear, graphic, engaging, relevant, uncluttered	Clear, relevant, uncluttered	Relevant, too much information	Unclear, too much information
Message (50%)	Clear, concise message; conveyed the science and its relevance	Clear, concise message; conveyed the science; lacked clarity in why it is important	Clear message; lacked clarity in science and its importance	Key point(s) unclear
Delivery (20%)	Within time, spoke clearly, good eye contact, enthusiastic	Within time, spoke clearly	Roughly within time limit, referred to notes on occasion, lacked eye content	Read notes, over time, hard to hear / spoke to the screen
Questions (10%)	Answered questions well; demonstrated knowledge of the topic	Answered questions well	Answered questions satisfactorily	Struggled with questions