School of Environment, Resources and Sustainability Faculty of Environment, University of Waterloo

ERS 315
Environmental and Sustainability Assessment II

Instructor:
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TAs:
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Lectures: Narrated Powerpoint Files will be posted on Learn under Weekly Folders
Synchronous Meetings: online through Webex Training will be held Tuesdays 11:30 am – 12:20
      pm Eastern Time for those able to attend, and will be recorded for those unable to attend.
Tutorials: held online through Webex Training at the following times (these will be recorded for
      those unable to attend)
                101: Tuesday 1:30–2:20 pm (Nat)
                102: Tuesday 2:30–3:20 (Nat)
                103: Wednesday 11:30 – 12:20 (Mark)
                104: Wednesday 12:30 – 1:20 pm (Mark)
      Please use a headset with a microphone for our synchronous meeting and tutorials.

Course Description:

      This course builds on what was introduced in ERS 215 about the several categories of EAs used in Ontario and Canada, and the common elements of EAs used worldwide. ERS 315 will focus on the mechanisms by which information is collected, analyzed and presented to predict the future state of environmental parameters and the significance of impacts of human developments on those parameters. Tutorial work will be semi-directed and self-guided. The assumption in ERS 315 is that students are already familiar with the principles and basic design requirements of impact assessment and that they have some understanding of the role of impact assessment in planning, management, and regulation particularly for Ontario or areas under the jurisdiction of the federal government. The concepts introduced to you in ERS 215 and 315 are applied to a broader range of pursuits in the next course in the assessment series, ERS 415. ERS 215, ERS 315 and ERS 415 are all required courses for the Environmental Assessment Diploma.

Intended Learning Outcomes:

      The learning outcomes of this course are intended to equip students with the skills to understand the "how" of the EA process. By the end of the course students will be familiar with various impact prediction methods (both biophysical and social) and how to determine the significance of these environmental effects. Specifically, for projects subject to formal federal or provincial environmental assessment, by the end of this course you will be able to (and exemplify with actual case studies):

1. Screen and Scope a project
2. Identify and quantify Valued Ecosystem Components (VEC)
3. Predict future condition of VECs with and without the project being proposed
4. Recommend and implement tools and frameworks for managing impacts
5. Quantify impact magnitude and significance before and after impact management
6. Effectively engage various publics in all relevant stages of Environmental Assessment

Approach:

Narrated Powerpoint lectures, assigned readings and optional (i.e., for greater interest) readings will be posted on Wednesdays and can be viewed at your convenience. Please email me any questions you have about the material. The following Tuesday we will have a synchronous meeting, through WebEx Training, during which I will answer any questions I have received. As well, during the synchronous meeting you will be able to ask additional questions either verbally or through the chat function. Also, during these synchronous meetings, I will present some material and we will have guest speakers. These synchronous meetings are intended to replace some of the interaction that we would normally have together in a face-to-face class. It is understood that not everyone may be able to attend all of these meetings, because of being in a different time zone, lack of access to good internet, or other commitments. Therefore, we will record these meetings and they can be viewed at your convenience.

Communication:

Your UW email account will be used for communication outside of our synchronous meetings and tutorials, so check your UW email and LEARN accounts regularly. All course announcements will be posted to LEARN. An effort will be made to deal with email requests within two business days of receipt. The instructor does not respond to email outside of regular working hours (M-F ~9AM-5PM).

Office Hours:

Office hours are a time that the Instructor will be available to talk with you about anything related to ERS 315. Meetings will be held by MS Teams, by another platform (e.g., Zoom) or by telephone. On the ERS 315 LEARN site there is a link to a poll on the left-hand side of the home page. Please fill out this poll by Sept. 16 with your preference for office hours. If the office hours that are established do not work for you, you can still email me with any concerns or questions and then I can set up an MS Teams video call with you as necessary. Please put ERS 315 in your email subject line and use your UW email account.

Website: (LEARN, ERS 315) https://learn.uwaterloo.ca/d2l/home

You will need to access the course website frequently, as some of the course material will be made available and managed through LEARN (Desire2Learn).

Required Readings:

Weekly reading will be posted on LEARN. It is your responsibility to check LEARN regularly for these readings. The required text for ERS 215 provides many relevant materials and concepts that are built upon in ERS 315. This time we are reading Noble 2015 through a

lens of HOW EAs are conducted rather than WHAT an EA is:

Noble, B. (2015). Introduction to Environmental Impact Assessment: A Guide to Principles and Practice, 3rd Edition. Don Mills, ON: Oxford University Press.

Additional material will be presented in class and/or made available through the LEARN website so make sure to check LEARN often.

Evaluation:

Your final grade will be based on two tests, a group presentation, feedback to your tutorial-mates on their group presentations (i.e., questions, constructive comments) and a final individual assignment. There is no final exam during the exam period in December. The professor determines the content and establishes the grading rules for all assignments, course components and the tests. The teaching assistants will assist the instructor with grading course work. The tests will be based on material covered in lectures and tutorials, including guest lectures and readings. When determining a student's final grade in the course, the instructor will examine the record of each individual student's achievement; the final grade may be adjusted to take into account extenuating and compassionate circumstances and the student's general pattern of achievement in the course.

Course Component and Due Dates	Percentage
Midterm Test (**Week 6: October 19-23**)	**20%**
Group Methods Presentation (**Due October 19 and discussed in tutorials Oct 27/28 & Nov 3/4**)	**25%**
Feedback on others' Methods Presentations (5 x 2%; **Due Oct 25**)	**10%**
Individual Assignment: (**Due: November 22**)	**25%**
Final Test (**Week 12: November 30 – December 4**)	**20%**

Description of Elements:

Tests
There will be two tests during the course: one on the first half of course during Week 6 (Oct 19-23) and the other emphasizing the second half of the course but including the entire course in Week 12 (Nov 30 – Dec 4). Materials from asynchronous online lectures, synchronous meeting times, tutorials, guest speakers, case studies and assigned readings are all be eligible for inclusion. The format will be open-book, multiple choice questions (1h time-limited) and short answer (open full week). We will have review sessions before each test and go through sample questions together.

Group Methods Presentation
This assignment is about how to make good predictions about the environmental impacts of a project and to gain hands-on experience with a real assessment. The format will be introduced in your tutorial in Week 2. You will be assigned to a group with 3-4 other students. Together you

will choose a completed Environmental Assessment and prepare a 10-15 minute recorded presentation describing the project and two impact prediction methods that were used – one that dealt with a social impact (i.e., an impact on a social Valued Component or VC) and another which dealt with a biophysical impact (impact on a biophysical VC). You will critique how well these predictions were made, both before and after whatever impact management measures that were proposed. Presentations must be uploaded to LEARN by midnight, Monday October 19. Over the next week, you then review the presentations of the other groups in your tutorial section and submit questions and comments by midnight Sunday October 25. During tutorials October 27/28 and November 3/4 your group will be asked to respond to, and discuss, questions and comments that were submitted by other members of your tutorial group.

Environmental Assessment documents can be very long and confusing. To ensure that you have a completed EA to work from, you must submit a short proposal on your chosen EA by midnight Sunday September 27. Your TA will confirm for you that you have suitable materials to work from. For this exercise, we will focus on federal assessments completed on projects between 2012 and present. Projects can be searched through the Canadian Impact Assessment [Registry](). When you click on the ''Search'' icon within the Registry home page you will be brought to the search filter page. Using the search filters, Assessment Status (completed) and Assessment Type (EAs under CEAA/IAAC), type in key words such as EIS (Environmental Impact Statement). This will allow you to find completed projects that have an EIS included. Within those documents, look for sections which may be labelled something like: potential environmental effects, mitigation measures, significance of residual environmental effects, impact assessment and mitigation measures, determination of significance. Each report or statement is set up a little differently so you will have to hunt around a bit. Part of the value of this exercise is to bring you face-to-face with how big and complicated an Environmental Assessment can be.

Expectations
Provide your TA with a link to the EA and which Valued Components (VCs) you plan to examine as soon as you've decided and not later than midnight Sunday September 27. Your group could choose to work on the same EA as another group (though it would be more interesting if you didn't) but if you do you have to choose different VCs.

- Context – 10%
    - Title Slide: *Names, name of project, Valued Components (VC)/impacts selected*
    - Introduce and provide background on project
        - *What is the project? Where is the project? Who did the assessment?*
    - Project has a completed assessment
- Methods – 50%
    - How were VCs chosen?
    - Choose 1 social and 1 biophysical VC.
    - Describe how potential impacts on your selected VCs were identified
    - How were predictions of impact on your selected VCs developed? *e.g., modelling, survey, literature*
- Critical Assessment – 25%
    - Consider the following questions:
    - Were the techniques used appropriate? Were assumptions valid and supported?

– How do we know if they got it right? Consider mitigations, residual effects (effects – mitigation = residual), how were residual impacts managed (e.g., offsetting, follow-up monitoring
– How much do we believe the predictions that were made?
– Was the prediction based on very little data or unreliable data?
– If people/stakeholders were consulted, was it done comprehensively or was just one sector of the population consulted?
– If experts were consulted, how was their expertise assessed?
– Were baseline data collected?
– Were experiences of other similar projects and assessments considered?

– Delivery and Organization – 15%
  – Presentation was clear and flow was logical
  – From questions and comments of other students, and from the assessment of your TA, it was clear that the project context and methods of impact prediction on your selected VCs were clearly understood
  – Read, fill out and submit *Group Work Checklist* (at the end of this document)

Questions and Comments on Presentations of Other Groups
In Week 6 (October 19-23) review the presentations of the other 5 groups in your tutorial section. For each group, prepare one or more questions or constructive comments and submit these to LEARN by midnight Sunday October 25.

Individual Assignment

For your individual assignment, you will explore a controversial case study in southeast British Columbia called the Castle Project. Teck Coal Limited has proposed to expand their open-pit metallurgical (used for making steel) coal mine of Fording River Operations. On August 19, 2020, federal Environment Minister Jonathan Wilkinson designated the project, meaning that the federal government will join the environmental assessment for this project, which had been proceeding through a provincial EA process. Impacts of the mining operation may be felt in the Fording River which flows into the Elk River which, in turn, flows into the Kootenay River which enters Montana (where it is spelled Kootenai River) and then Idaho. Interveners include five First Nations on both sides of the border, 34 environmental organizations and the USEPA (Vancouver Sun 2020-08-19). You will have the opportunity in your tutorials to explore this controversial project further. For your final assignment, you will write a 6-8 page essay with the following components (each section is worth 5%):

1. *Select five valued ecosystem components (VECs)* that are likely to be selected based on this proposed project. Using literature and news articles to select what you feel will likely be chosen as VECs by the stakeholders and rightsholders involved in and affected by this project (indicate who the VEC is important to). Make sure to reference appropriately and clearly justify these selections. You must include at least one social and one biophysical VEC in your selection since you will need one of each for Part #3 below.

2. *Complete a simple interaction matrix* for the five VECs selected above. Make sure you use the literature and news articles to help you determine and justify the likely potential for impact. Examples of interaction matrices will be discussed in tutorials and posted to LEARN. Use Figure 8.4 from Noble, 2015, 179 as an example and choose project activities that are realistic and based on the literature, news articles and similar EAs

3. *Select one social and biophysical impact and discuss a method for each* that you would use to determine the magnitude of the impact. Indicate why these methods are appropriate for each of the VECs and discuss how you would carry out the two methods to determine the likely impact of the project on the VEC. All points should be referenced using the literature and similar EAs.

4. Using the magnitude of these two impacts (social and biophysical) that you discussed in Part #3 *determine the importance (value) placed on the two VECs and then discuss the significance* of the likely impacts. The magnitude (the amount of change in a parameter relative to a baseline condition, use the impact score given in your impact matrix from #2) is expressed in qualitative descriptions. Use the language of low, medium, high to clearly describe the magnitude of VEC impacts. The value or importance attached to the two VECs is described and justified with literature, news articles and similar EAs. The magnitude and value/importance are then combined and the significance on the impact is clearly described.

5. *Suggest and discuss two possible management measures* (one each) for the biophysical and social impacts that you selected in Question #3. These measures might create or enhance an impact that is positive (e.g., job creation) or avoid, mitigate, remediate or compensate for an adverse impact (e.g., destruction of habitat for a species at risk). Present a clear and logical discussion, with justification from the literature.

Tips:
Quality
-   Ensure your work is readable and clear
-   Organization, structure, style and presentation, research and quality of analysis/critique all count.
-   Students are expected to present well organized, and properly written work. You may find this reference useful: "Writing Effective Essays and Reports"
-   Diverse and proper references are important. Work is presented as an academic research paper that relies on diverse and proper referencing and in-text citations. There is no minimum number references as this is a third year class and all information you gather should be appropriately supported.
-   Assignments will be run through Turnitin – use your own words when paraphrasing

Format
-   Submit in .pdf format

- Your assignment must have a plain title page with the title of your assignment, your name, course number (ERS 315), the date, your student number, the term, your TA's name and the instructor's name.
- Maximum page length is 6-8 pages double spaced (excluding title page, impact matrix and reference list).
- Use [APA reference](#) format for all references including electronic sources
- Include page numbers
- Include your name & student ID number on each page (inserting this into a 'header' is the easiest way to go).
- Times New Roman, 12 font and 1" margins
- All figures and Tables must have proper descriptive headings, quotes should have page numbers (keep quotes to a minimum)

Hints:
- Seek out help from your TAs – they are there to help you
- Begin well in advance of the deadline – last minute work is usually obvious to markers.
- As you write, use the concepts, language and ideas presented in lecture materials as a source of inspiration/discussion in your assignment.
- Create sub-headings for each of the main sub-sections (you can remove these or keep these later…they are intended as a guide to writing to ensure you address each sub-section!).
- Cite all materials/information you obtain from sources other than your own personal knowledge.
- Don't forget to include personal knowledge and 'brainstorming' in your analysis – it's a very powerful way to personalize your writing.
- Proofread and spell-check your work before submission and/or exchange assignments with a classmate (peer review)

Handing in your Assignments:
You are responsible for making sure that your professor receives your work. Both assignments are to be submitted to the appropriate LEARN dropbox using the course website.

Lost or misplaced assignments: It is your responsibility to make more than one electronic copy of your work. Excuses are not accepted in the case of crashed computer and lost or misplaced work.

Questions about your *Assignments*:
Any questions regarding your mark or any feedback on your assignment are to be directed towards your TA. Any concerns after talking with your TA can then be sent to the instructor. Any requests for remarking of a test question and/or an assignment must be submitted in writing to the instructor within *two weeks* of the release of the mark for the test/and or assignment in question Your request for a remark must be specific and you must be able to clearly state what questions or component you feel were mis-marked and why**.**

Proposed Schedule (subject to change):

Week	Recorded Lecture posted previous Wednesday	Online Meeting Tues 11:30-12:20	Tutorial Tuesday or Wednesday	Readings **for next week** (optional further readings will be posted on LEARN)
1 S8-11		Introductions Course Outline and Expectations	Review of principles and practice from ERS 215	Course Outline Noble Chap 13 & 3
2 S14-18	Career paths in EA, Overview of Assessment Tools	Vegetation Sampling Protocol (Bev Raimbault & Anne Grant; ENV Ecology Lab)	Questions on syllabus? Introduction to Group Presentation	Noble Chap 4 & 5
3 S21-25	Tools for trends & assoc in EA Screening, Scoping VECs, Indicators Baseline	Ontario Benthos Biomonitoring Network (Bev Raimbault & Anne Grant)	Review of Valued Components, Selection, use of indicators, baseline study, Determining Impact Significance	Noble Chap 6 & 7 Group Project Proposal due Sept 27
4 S28-O2	Predicting & Managing Env Impacts	Wildlife sampling (Phil DeWitt, OMNRF, Senior Ecologist, Wildlife Monitoring Lead)	Individual project introduction, expectations & rubric Teck Castle	Noble Chap 8 & 9
5 O5-9	Impact magnitude vs significance pre, post management predicting signif	Aquatic Env. Effects Monitoring, Cumulative Effects Monitoring	Review for first in-class test Work on group methods presentation	
O12-16	READING WEEK – NO LECTURE OR TUTORIAL			
6 O19-23	Midterm test, no Meeting or Tutorial. Group Methods Project due Oct 19; View other groups' projects & submit questions Oct. 25			Esteves et al. 2012 Hjorth and Bagheri 2006
7 O26-30	Midterm test review, Course Part 2 Intro	Monitoring & predicting social impacts	Discussion on Group Methods Presentations	
8 N2-6	Indigenous engagement in EA – Professor Kelsey Leonard, ENV	Riverside Dam, City Councillor Pam Wolf & Project Engineer Scott MacDonald	Discussion on Group Methods Presentations	O'Reilly, K. 2015. Kucic-Riker, J. 2017.
9 N9-13	Human Health & Ecol. Risk Assess, Prof Susan Elliott, UW- GEM	Giant Gold Mine, Yellowknife NWT – MLA for Frame Lake Kevin O'Reilly	EA in the news: Case Study #1 Site C Dam, Peace River, BC	Noble Chap. 10 Public Participation in EA CBC Doc "The Mill. What Divides a Community Can Bring It Together In New Ways"
10 N16-20	Public Particip. in EA; Kwadacha by the River film	Economic tools in EA – Prof. Roy Brouwer, UW-Economics	EA in the news: Case Study #2 Northern Pulp, Pictou, NS	Individual Project Due Nov. 22
11 N23-27	Review for final in-class test	Experience of young, local working ecologists	Review for final in-class test Course evaluation	
12 N30-D4	IN CLASS TEST – NO LECTURE OR TUTORIAL			

The following student signed Checklist was developed by the University of Waterloo Secretariat as a means of emphasizing the importance of attribution of referenced work and reducing plagiarism.

For Group Assignment:

Please read the disclosure below following the completion of your group presentation. Once you have verified these points, hand in this signed disclosure with your group assignment.

1. All team members have referenced and footnoted all ideas, words or other intellectual property from other sources used in the completion of this presentation.
2. A proper bibliography has been included, which includes acknowledgement of all sources.
3. Each student has identified his or her individual contribution to the work submitted such that if violations of academic integrity are suspected, then the student primarily responsible for the violations may be identified. Note that in this case the remainder of the team may also be subject to disciplinary action.

Date: _____

Name (print)	Signature	Contribution

Course and University Policies

Note for Students with Disabilities:
The University of Waterloo is committed to ensuring you can access, and meaningfully participate in, your education. AccessAbility Services is the University's centralized office for the management of academic accommodations for all students with disabilities. You can reach them at: 519-888-4567, ext. 45231 or 47922, or email: access@uwaterloo.ca.

Mental Health:
The University of Waterloo, the Faculty of Environment and our Departments/Schools 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. Campus Wellness includes Counselling Services and Health Services and 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:
Students need to 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.

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. Guidance on Academic Integrity at UW is available here. Students who are unsure what constitutes an academic offence are requested to visit the on-line tutorial at: http://www.lib.uwaterloo.ca/ait/.

Discipline:
A student is expected to know what constitutes academic integrity, to avoid committing academic offence, and to take responsibility for their 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, http://www.adm.uwaterloo.ca/infosec/Policies/policy71.htm. For typical penalties, check Guidelines for Assessment of Penalties,
http://www.adm.uwaterloo.ca/infosec/guidelines/penaltyguidelines.htm

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, http://www.adm.uwaterloo.ca/infosec/Policies/policy70.htm. When in doubt please contact your Undergraduate Advisor for details.

Appeals:

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

University Policies: Plagiarism

Please familiarize yourself with the University of Waterloo's policy dealing with plagiarism. Be especially careful when using materials from the internet, and be aware that software available to instructors can be used to check student submissions for plagiarism (e.g. www.Turnitin.com). Plagiarism offices are normally treated quite seriously by the University and can result in significant penalties being assessed (e.g. failing grade on an assignment, repeating a course, suspension or expulsion). **Paraphrase using your own words and reference ideas appropriately.**

Turnitin:

Plagiarism detection software (Turnitin) may be used to screen assignments in this course. Turnitin is primarily a plagiarism detection tool, but can also be used to help students understand academic integrity in written assignments. Turnitin generates 'originality reports' on student submissions, which can provide instructors with information about plagiarized sources, but the reports can also be used to help students understand the proper use of quotation marks, how to cite sources properly, and how to paraphrase.

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. NOTE: any student not wishing to submit materials for Turnitin detection must contact the instructor by September 21 to arrange for an alternative assignment.

Definition of Plagiarism: *"The act of presenting the ideas, words or other intellectual property of another as one's own."- Source: University of Waterloo, Policy 71.*

To Avoid Plagiarism

The use of other people's work *must* be properly acknowledged and referenced in all written material such as take-home examinations, essays, research papers, laboratory reports, work-term reports, design projects, statistical data, computer programs and research results. The properly acknowledged use of sources is an accepted and important part of scholarship. Use of such material without complete and unambiguous acknowledgement, however, is an offence under Policy 71.

Quoting, paraphrasing, and summarizing (source:

http://owl.english.purdue.edu/owl/resource/563/1/)

These three ways of incorporating other writers' work into your own writing differ according to the closeness of your writing to the source writing.

- **Quotations** must be identical to the original, using a narrow segment of the source. They must match the source document word for word and must be attributed to the original author with page number.
- **Paraphrasing** involves putting a passage from source material into your own words. A paraphrase must also be attributed to the original source. Paraphrased material is usually shorter than the original passage, taking a somewhat broader segment of the source and condensing it slightly.

Summarizing involves putting the main idea(s) into your own words, including only the main point(s). Once again, it is necessary to attribute summarized ideas to the original source. Summaries are significantly shorter than the original and take a broad overview of the source material.

Numeric grades on a scale from 0-100 are used in grading all assignments at the University of Waterloo. The following list will give you an idea of the basis upon which numeric grades are assigned:

>90% Work that shows a high level of initiative and is clearly above and beyond what is expected. Referencing, style, grammar/spelling, content and the development of ideas are all superior. (similar to A and A+ in the previous system)

80-89% Work that shows good initiative and is above what is expected. Referencing, style, grammar/spelling, content and the development of ideas are all good. (Similar to B+ and A- in the previous system)

70-79% Work that shows initiative and is about what is expected, but one or more problems are evident in referencing, style, grammar/spelling, content and/or the development of ideas. (Similar to B- and B in the previous system)

60-69% Work that does not demonstrate initiative, has a series of problems in referencing, style, grammar/spelling, content and/or the ideas, and overall, does not fully convince the reader that the topic has been well considered (Similar to C-, C and C+ in the previous system)

50-59% Work that is substandard/sloppy in places, has many problems in referencing, style, grammar/spelling, content and/or the development of ideas, and overall, raises more questions in a reader's mind than the work answers. (Similar to D-, D and D+ in the previous system)

40-49% Work that is of consistently poor quality, demonstrates gaps in comprehension of the assigned material, and/or indicates that not enough time was taken to properly address the assignment. (Similar to F and F+ in the previous system)

<40 Work that is clearly of poor quality, demonstrates a lack of comprehension of the assigned material, shows little attempts at a personal development of ideas or efforts to back up arguments with suitable evidence, and/or indicates that the work was completed 'at the last minute'