



UNIVERSITY OF
ALBERTA



RENr 427 / NOST 229

SCIENCE POLICY AND THE CANADIAN NORTH

In Winter 2019, NOST 229, *Science Policy in the Canadian North*, is being offered at Yukon College concurrent with the University of Alberta's RENr 427, *Science Policy in the Canadian North*, as part of the Northern Environmental and Conservation Sciences, B.Sc. Program. All students registered in NOST 229 or RENr 427 must adhere to requirements outlined in this course syllabus. University of Alberta students must also be aware of, and adhere to, the University's Code of Student Behaviour, referenced in the outline; Yukon College students must be aware of, and adhere to, Yukon College's Academic Regulations, also referenced in the outline.

INSTRUCTOR:

Dr. Aynslie Ogden

Adjunct Faculty, Yukon College; Adjunct Faculty, University of Alberta; Senior Science Advisor, Executive Council Office, Government of Yukon

OFFICE HOURS:

Immediately after class or by appointment

OFFICE LOCATION:

1191 Front Street, Suite 202 (by appointment)

TELEPHONE/E-MAIL:

867-667-5431, aynslie.ogden@gov.yk.ca

CLASS DAYS & TIMES: Tuesday and Thursday, 4:30-6:00

CLASS LOCATION: A2402

COURSE DESCRIPTION:

The purpose of this course is to expose students to key themes in science policy in the Canadian North, and to prepare students for careers at the northern science-policy interface. Case studies from the Canadian North will be used to explore the main themes of the course.

This course targets 1) students in the Northern Environmental and Conservation Sciences, B.Sc. Program and 2) is a recommended 3-credit elective in several diploma programs in the Applied Arts and Applied Science and Management Divisions including the Northern Studies, Renewable Resources Management and Northern Science programs. Requirements for BSc students, evaluation and course grade will be assessed differently than those taking this course at the diploma level. This course is also suitable to a broader audience including working science and/or policy practitioners and professionals.

STUDENT LEARNING OUTCOMES AND COMPETENCIES:

Upon successful completion of this course students will be able to do the following:

- Articulate the basic elements of the policy-making process and how science contributes to policy making
- Understand the process by which scientific knowledge is generated and the role science plays in society
- Develop an understanding of the two elements of science policy: science for policy, and policy for science
- Articulate elements of successful science-policy integration including the role of the scientist, and the role of the policy maker
- Have detailed knowledge of a number of case studies in northern Canadian science policy
- Apply critical thinking, writing, oral presentation and research skills

COURSE FORMAT (3-0-0):

This 13-week course will take place in the early-evening, two times a week, in the winter semester.

The course is divided into weekly modules. Each module includes required and recommended readings and will be accompanied by study questions that will form the basis of the examinations. Students will be expected to read assigned module readings, and encouraged to explore and read supplementary material. Other media may be included (e.g. video, internet) or suggested. Students are recommended bring issues and questions on the study questions to class or to the instructor during office-hours.

Students are required to complete 3 assignments targeted to developing competency in applying scientific evidence to policy making that will be due within a week of being assigned. Students will also be required to carry out a science-policy analysis that will involve developing a proposal, a written paper, and an oral presentation to the class. Students will have a mid-term and a final exam. The assignments may involve presenting answers to the class and/or submitting written answers to the instructor.

A number of guest speakers will be invited to participate in the course. In addition, a number of classes will be seminar-format, which means that in these classes students will share responsibility for leadership in learning.

COURSE PREREQUISITES AND/OR CO-REQUISITES:

As on-line resources will supplement classroom instruction, students planning to take this course are required to have access to the internet. As students will be required to go online weekly to access required reading materials on the course website, it is the student's responsibility to be familiar with accessing course materials via Yukon College's Moodle system.

For students taking the course as NOST 229

Students with a second-year standing in the Applied Arts or Applied Science and Management Divisions, or permission of the instructor or a program advisor in the Applied Arts or Applied Science and Management Divisions, are eligible to take the course. Students in the first year of a diploma program with relevant work experience may register with permission from the instructor.

For students taking the course as RENR 427:

Registration in Yukon College/University of Alberta BSc in Environmental and Conservation Sciences degree program. U of A students are responsible for ensuring they have the necessary pre-requisites and co-requisites. Students may be dropped before or after the course drop date if pre-requisites and co-requisites are not met. If the instructor agrees to waive a pre-requisite or co-requisite, students must fill out a form in the office of Student Services and get a signature from the instructor.

For working professionals interested in auditing the course:

This course may be of interest to working professionals and practitioners who are not registered in a program at Yukon College or another institution but work in a field that would benefit from a background in science policy. Participation by these students is encouraged. These students require the instructor's permission to register. Participation by students outside of Whitehorse may be possible by web conference – please let the instructor know if you are interested in this option.

REQUIRED TEXTBOOKS/MATERIALS:

Required reading

No one text covers this course. In addition, students should not expect that the notes they take during class will be adequate to equip them to participate in class or to be prepared for examinations. The required reading list below will be part of testable material. It is the student's responsibility to go online weekly to access required and recommended reading materials. In addition, students will be expected to create their own reading list that is relevant to the topic of their science policy review. The reading list below is subject to change. The final required and recommended reading list will be updated on the course website throughout the term.

Required readings (available at Yukon College Bookstore):

The following texts are essential resources for the student's science policy review.

- Boland, A., M. G. Cherry and R. Dickson. 2017. *Doing a Systematic Review: A Student's Guide*. Sage Publications. (required for RENR 427 students, recommended for NOST 229 students)

- Hammond, J.S., R.L. Keeney and H. Raiffa. 2015. *Smart Choices: A Practical Guide to Making Better Decisions*. Harvard Business Review Press. (required for RENR 427 students and NOST 229 students)

The following text provides critical analysis and insight into how science contributes to policy making, the process by which scientific knowledge is generated and the role science plays in society.

- Goldacre, B. 2014. *I think you'll find it's a bit more complicated than that*. Fourth Estate. (required for RENR 427 students and NOST 229 students)

Required readings that will be made available online:

Morris, R. 1998. *How to tell what is science from what isn't*. In: Brockman (ed.) *Doing science: the reality club*.

Council of Canadian Academies 2014. *Science culture: where Canada stands*. (Report in Focus)
http://www.scienceadvice.ca/uploads/eng/assessments%20and%20publications%20and%20news%20releases/science-culture/scienceculture_rif_en.pdf

Compound Interest. 2014. *A rough guide to spotting bad science*. <http://www.compoundchem.com/2014/04/02/a-rough-guide-to-spotting-bad-science/>

Wilson and Arvai, 2011. *Structured decision-making: Using decision research to improve stakeholder decision making and results*. Oregon State University.

Assembly of First Nations. 2007. *OCAP (Ownership, Control, Access and Possession): First Nations Inherent Right to Govern First Nations Data*. Available online: <http://64.26.129.156/misc/ocap.pdf>

Karrer L. et al. 2011. *Science-to-Action Guidebook*. Science and Knowledge Division, Conservation International, Arlington, Virginia, USA. Available online: <http://www.science2action.org/>

HM Government. 2005. *Guidelines on scientific analysis in policy making*. Available online: <http://webarchive.nationalarchives.gov.uk/+http://www.dti.gov.uk/files/file9767.pdf>

International Arctic Science Committee. 2013. *Statement of Principles and Practices for Arctic Data Management*. Available online: http://www.iasc.info/images/pdf/IASC_data_statement.pdf

Pielke, R. A. (2007) *The Honest Broker: Making sense of science in policy and politics*. Chapters 1-4. Cambridge University Press.

Government of Northwest Territories. *Summary of best practices for applying traditional knowledge in Government of the Northwest Territories Programming and Services*. Available online: https://www.enr.gov.nt.ca/sites/enr/files/reports/tk_best_practices_summary.pdf

Recommended reading

A list of recommended readings will be provided for each class. Where possible, these readings will be available online for free download. Students will not be tested on these readings, but may wish to consult these references for additional clarity on topics discussed in class. The readings may also be

useful to cite in their research paper, depending on the student's topic. In addition, the readings may provide additional insight/content/guidance to support a weekly class participation/homework assignment. Recommended readings that are not available online will be made accessible through the Yukon College library and/or may be purchased through an online book retailer such as Amazon. In addition to the recommended reading list, students should be prepared to conduct additional, independent research to source appropriate materials to support the completion of their assignments. Note: The reading list below is subject to change. The reading list will be updated on the course website throughout the term.

Collins et al. 2015. *The Production of Quick Scoping Reviews and Rapid Evidence Assessments: A How to Guide*. Available online: <https://connect.innovateuk.org/web/jweg>

California Department of Fish and Game. 2008. Appendix E: Social science tools and methods. In: California Marine Life Protection Act Master Plan for Marine Protected Areas. Available online: <https://www.dfg.ca.gov/marine/pdfs/reviseemp0108.pdf>

Gregory, R., L. Failing, M. Harstone, G. Long, T. McDaniels and D. Ohlson. *Structured Decision Making: A Practical Guide to Environmental Management Choices*. Wiley-Blackwell.

AAAS, 2013. *Special Issue on Science Communications*. Science Vol 342, 4 October 2013. Available online: <http://www.sciencemag.org/site/special/sciomm/index.xhtml>

Baron, N. 2010. *Escape from the Ivory Tower: A Guide to Making your Science Matter*. Island Press.

Bogenschneider, K. and T.J. Corbett. 2010. *Evidence-Based Policy Making: Insights from policy minded researchers and research minded policymakers*. Routledge.

Bardach, E. 2005. *A Practical Guide for Policy Analysis: The Eightfold Path to More Effective Problem Solving*. CQ Press.

Cartwright, N. and J. Hardie. 2012. *Evidence-Based Policy Making: A Practical Guide to Doing it Better*. Oxford University Press.

Clark, T.W. 2002. *The Policy Process: A Practical Guide for Natural Resource Professionals*. Yale University Press.

European Commission Directorate General for Research. 2010. *Communicating research for evidence-based policy making: a practical guide for researchers in social sciences and humanities*. Available online: http://ec.europa.eu/research/social-sciences/pdf/guide-communicating-research_en.pdf

Government of Northwest Territories. 2017. *Government of the Northwest Territories Knowledge Agenda*. Available online: https://www.assembly.gov.nt.ca/sites/default/files/td_406-182.pdf

Government of Yukon. *Guidebook for Scientific Research in the Yukon*. Available online: http://www.tc.gov.yk.ca/publications/Guidebook_on_Scientific_Research_2013.pdf

Turner, C. 2013. *The War on Science*. Greystone Books.

Young, S.P. 2013. *Evidence-based policy making in Canada*. Oxford University Press.

Yukon College. 2013. *Protocols and Principles for Conducting Research with Yukon First Nations*. Available

online: http://www.yukoncollege.yk.ca/downloads/YRC_FN_Initiatives_no_photos_inside_final_print.pdf

Morris et al. 2013. *The Lakehead Manifesto: Principles for Research and Development in the North*. Arctic Vol 66 (2): iii-iv. Available online: <http://pubs.aina.ucalgary.ca/arctic/Arctic66-2-iii.pdf>

Ogden, A.E. and M.E. Thomas. 2013. *Letter to the Editor re: the Lakehead Manifesto*. Arctic Vol 66, No 4. Available online: <http://arctic.synergiesprairies.ca/arctic/index.php/arctic/article/view/4342/4322>

Task Force on Northern Research. 2000. *From Crisis to Opportunity: Re-building Canada's Role in Northern Research*. Available online: http://www.nserc-crsng.gc.ca/doc/Reports-Rapports/CrisisNorth-CriseNord_eng.pdf

The White House. *Presidential Memorandum on Scientific Integrity*. Available online: <http://www.whitehouse.gov/the-press-office/memorandum-heads-executive-departments-and-agencies-3-9-09>

COURSE WEBSITE

Yukon College's Moodle system will host the course website. The course website will be used to provide links to readings, lecture slides, study questions, assignments and the student's gradebook. It is the student's responsibility to check the course website weekly for updates. Students will also be required to submit assignments through Moodle. Yukon College's Knowledgebase is a helpful resource for how to use Moodle <https://www.yukoncollege.yk.ca/knowledgebase>

YUKON COLLEGE ACADEMIC STANDARDS AND REGULATIONS

Information on academic standing and student rights and responsibilities can be found in the current Academic Regulations that are posted on the Student Services/ Admissions & Registration web page.

Plagiarism

Plagiarism is a serious academic offence. Plagiarism occurs when a student submits work for credit that includes the words, ideas, or data of others, without citing the source from which the material is taken. Plagiarism can be the deliberate use of a whole piece of work, but more frequently it occurs when students fail to acknowledge and document sources from which they have taken material according to an accepted manuscript style (e.g., APA, CSE, MLA, etc.). Students may use sources which are public domain or licensed under Creative Commons; however, academic documentation standards must still be followed. Except with explicit permission of the instructor, resubmitting work which has previously received credit is also considered plagiarism. Students who plagiarize material for assignments will receive a mark of zero (F) on the assignment and may fail the course. Plagiarism may also result in dismissal from a program of study or the College.

UNIVERSITY OF ALBERTA ACADEMIC INTEGRITY AND CODE OF STUDENT BEHAVIOUR

Academic Integrity

The University of Alberta is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Code of Student Behaviour (online at www.governance.ualberta.ca) and avoid any behaviour which could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University.

Code of Student Behaviour

All students at the University of Alberta are subject to the Code of Student Behaviour, as outlined at:

<http://www.governance.ualberta.ca/en/CodesofConductandResidenceCommunityStandards/CodeofStudentBehaviour.aspx> Please familiarize yourself with it and ensure that you do not participate in any inappropriate behavior as defined by the Code. Key components of the code include the following statements.

30.3.2(1) No Student shall submit the words, ideas, images or data of another person as the Student's own in any academic writing, essay, thesis, project, assignment, presentation or poster in a course or program of study.

30.3.2(2) c. No Student shall represent another's substantial editorial or compositional assistance on an assignment as the Student's own work.

PROFESSIONALISM AND CLASSROOM RULES OF ENGAGEMENT

Students are expected to attend all lectures, be engaged and courteous in all course activities, and to be on time for class. Please do not use cellular phones during class. Laptops are permitted for note taking and in-class work; however, please do not use laptops in class for non-class-related activities.

COURSE REQUIREMENTS/EVALUATION:

Assignments

Marking schemes and guidelines for each main aspect of the course upon which students will be evaluated will be provided.

NOST 229 Course Assignments

1. Assignments – Students will be required to complete 3 assignments targeted to developing competency in applying scientific evidence to policy making that will be due within a week

of being assigned.

2. Science-Policy Analysis Proposal – Students will be required to submit a proposal for their science-policy analysis review paper. A template for the proposal will be provided by the instructor. Students will be strongly encouraged to meet with the Instructor during office hours to discuss their proposal before it is submitted.
3. Science-Policy Analysis Review Paper – Students will prepare an analytical review paper on a science-policy topic, chosen in consultation with the instructor (typed/word processed, 2,500 to 3,000 words). Each paper must include a reference list/bibliography. Regular statements/indications of progress on the paper will be required. As an alternative to the review paper, and subject to approval by the instructor, students can propose and complete a project of their interest to meet the writing/research aspects of the course.
4. Presentation of Science Policy Analysis– Each student will be required to deliver a 10-minute presentation on their science policy analysis review paper or project. Presentations will be graded on the clarity of the material presented, oral presentation skills, and the quality of visual presentation aids. Students will sign up for presentation slots that will be held during the last week of the course.

REN 427 Course Assignments

Detailed marking schemes and guidelines for each main aspect of the course upon which students will be evaluated will be provided throughout the term.

1. Assignments – Students will be required to complete 3 assignments targeted to developing competency in applying scientific evidence to policy making that will be due within a week of being assigned.
2. Science-Policy Analysis Proposal – Students will be required to submit a proposal for their science-policy analysis review paper. A template for the proposal will be provided by the instructor. Students will be strongly encouraged to meet with the Instructor during office hours to discuss their proposal before it is submitted.
3. Briefing Note – Each student will be required to prepare a briefing note using the template provided. The briefing note will be graded on the clarity of the material presented, and suitability of the material presented to the intended audience (a senior decision-maker).
4. Plain-Language Summary - Each student will be required to prepare a plain language summary of a scientific paper using the template provided. The plain language summary will be graded on the clarity of the material presented, and suitability of the material presented to the intended audience (the general public).

5. Science-Policy Analysis Review Paper – Students will prepare an analytical review paper on a science-policy topic, chosen in consultation with the instructor (typed/word processed, 3,000 to 4,000 words). Each paper must include a reference list/bibliography. Regular statements/indications of progress on the paper will be required. As an alternative to the review paper, and subject to approval by the instructor, students can propose and complete a project of their interest to meet the writing/research aspects of the course.
6. Presentation of Science Policy Analysis– Each student will be required to deliver a 10-minute presentation on their science policy analysis review paper or project. Presentations will be graded on the clarity of the material presented, oral presentation skills, the quality of visual presentation aids, and quality of responses to questions posed by the Instructor and the class following the presentation. Students will sign up for presentation slots that will be held during the last week of the course.

Exams

The exams for students enrolled in the course as NOST 229 will differ from students enrolled in the course as RENR 427. Higher expectations will be placed on students enrolled in the course as RENR 427.

1. Exam I (Take home exam) – There will be take home exam consisting primarily of short answer and essay questions at the middle of the term. Exam questions will be based on the readings, the lectures and on the study questions that accompany the readings.
2. Exam II – There will be a 3-hour exam consisting primarily of short answer and essay questions at the end of term. Exam questions will be based on the readings, the lectures and on the study questions that accompany the readings

Due Dates and Late Assignments

All out of class assignments are due at the beginning of class and must be submitted online through the course website.

Students are expected to abide by the due dates listed below. Students will be penalized for handing in assignments late. Assignments submitted up to one week late after the deadline will have 25% deducted from the mark. Assignments submitted up to two weeks late will have 50% deducted from the mark. After two weeks, a mark of 0% will be given.

If a student is aware that they have a conflict with a due date, it is the student's responsibility to make arrangements with the instructor at least two weeks in advance of the due date. The student will be required to make arrangements to hand in the assignment or complete the exam in advance of the due date or will be subject to the penalties noted above.

Students enrolled in the course as NOST 229:

TBD	Assignments (3)
January 31, 2019	Science-policy analysis proposal
Assigned February 14, due February 26, 2019	Take home exam (Exam I)
March 28, 2019	Science-policy analysis paper
April 2 or 4, 2019	Presentation of science-policy analysis
TBD, during YC exam period	Exam II

Students enrolled in the course as RENR 401K:

TBD	Assignments (3)
January 31, 2019	Science-policy analysis proposal
February 7, 2019	Briefing note
Assigned February 14, due February 26, 2019	Take home exam (Exam I)
March 7, 2019	Plain language summary
March 28, 2019	Science-policy analysis paper
April 2 or 4, 2019	Presentation of science-policy analysis
TBD, during YC exam period	Exam II

Evaluation

The course grade will be determined as follows:

Students enrolled in the course as NOST 229:

	Percent
Assignments (3, each worth 5%)	15
Science-policy analysis proposal	10
Exam I (take-home)	15
Science-policy analysis review paper	25
Presentation of science-policy analysis	10
Exam II	25
Total	100

Students enrolled in the course as RENR 427:

	Percent
Assignments (3, each worth 5%)	15
Science-policy analysis proposal	10
Exam I (take-home)	10
Science-policy analysis review paper	25
Presentation of science-policy analysis	10
Briefing note	5
Plain-language summary	5
Exam II	20
Total	100

Assignment of grades

The total numerical score will be converted to a grade on Yukon College's letter grading system below.

Percent	Letter grade
95-100	A+
86-94	A
80-85	A-
75-79	B+
70-74	B
65-69	B-
62-64	C+
58-61	C
55-57	C-
50-54	D
0-49	F

ELECTRONIC DEVICES:

Use of electronic devices during examinations is restricted.

RECORDING OF LECTURES, LABS, ETC.:

Audio or video recording, digital or otherwise, of lectures, labs, seminars or any other teaching environment by students is allowed only with the prior written consent of the instructor or as a

part of an approved accommodation plan. Student or instructor content, digital or otherwise, created and/or used within the context of the course is to be used solely for personal study, and is not to be used or distributed for any other purpose without prior written consent from the content author(s).

Please note that some classes may be recorded using web conferencing software, and links to recordings may be posted on the class website.

YUKON FIRST NATIONS CORE COMPETENCY

Yukon College recognizes that a greater understanding and awareness of Yukon First Nations history, culture and journey towards self-determination will help to build positive relationships among all Yukon citizens. As a result, to graduate from ANY Yukon College program, you will be required to achieve core competency in knowledge of Yukon First Nations. For details, please see www.yukoncollege.yk.ca/yfnccr.

ACADEMIC ACCOMMODATION

Reasonable accommodations are available for students requiring an academic accommodation to fully participate in this class. These accommodations are available for students with a documented disability, chronic condition or any other grounds specified in section 8.0 of the Yukon College Academic Regulations (available on the Yukon College website). It is the student's responsibility to seek these accommodations. If a student requires an academic accommodation, he/she should contact the Learning Assistance Centre (LAC): lac@yukoncollege.yk.ca.

EQUIVALENCY/TRANSFERABILITY:

NOST 229 transfers as: UNBC NORS 2xx (3).

For current information on course transferability see <http://www.bctransferguide.ca>

RENr 427 is used to fill the requirement for ENCS 473 in the Northern Systems Major of the B.Sc. ENCS Program.

TENTATIVE SCHEDULE:

Week	Topic
<i>Introduction to science policy in the Canadian North</i>	
1	What is science and how do scientists know what they know?
2	What is policy and how is it developed?
3	Traditional knowledge: the third axis of science policy
4	Requirements for successful evidence-based decision-making
<i>Science for policy in the Canadian North</i>	
5	Show me the evidence! Evidence reviews: a comparison of methods
6	What policy questions social science can answer and how
7	Doing policy relevant science in the north
<i>Policy for science in the Canadian North</i>	
8	History of policy for science in the Canadian North
9	Science integrity, science professionalism, research ethics and licensing
10	Data policies: open data, OCAP, big data
<i>Science policy integration in the Canadian North</i>	
11	Barriers to using evidence in policy making and practice
12	Science communication
13	Roles of scientists and policy makers in successful science policy integration