# Syllabus: Indigenous Knowledge for Ecology and Conservation

**Course code:** BIOL855 (Conservation Biology), Winter 2025 (3 credits)

**Instructor:** Stephen C. Lougheed
**Co-Instructor:** Stafford Rotehrá:kwas Maracle

**Required Course material:**
*Traditional Ecological Knowledge: Learning from Indigenous Practices for Environmental Sustainability*. Melissa K. Nelson, Daniel Shilling (eds). Cambridge University Press. 2018. ISBN. 9781108552998 ~$31.00 from GoodMinds.com (and Indigenous-run bookstore) or Novel Idea in downtown Kingston.

**Proposal:**
As we face rapidly advancing environmental change caused by human development – intensive agriculture, resource extraction, habitat destruction & degradation, globalization, urbanization, and change – we find ourselves searching for practices to mitigate the impact on what remains of our natural systems. Much of our understanding of how humans do or should relate to and manage the natural world flow from Western science and a Eurocentric perspective. However, many Indigenous Peoples around the globe have seen substantial populations thrive while sustainably co-existing with their environments. Emerging recognition of the deep ecological knowledge held within Indigenous nations has brought hope for new approaches to sustainability and conservation, with distinct Indigenous worldviews, ecological perspectives and relationships that are inherently and purposely subjective and reflected in place-based practices.

Understanding the foundations of these distinct worldviews allows us to engage more effectively with knowledge holders and local Indigenous nations to implement two-eyed seeing for effective sustainable research and practices.

In this course, we will explore the book *Traditional Ecological Knowledge* (editors. Melissa K. Nelson, Daniel Shilling) comprised of short essays from Indigenous academics and knowledge holders discussing the foundations and nature of traditional ecological knowledge (Indigenous knowledge or IK as it is referred to now). These chapters provide teachings and lessons from specific Indigenous nations that are currently practiced and those that have sustained populations and ecosystems for thousands of years.

In our first meeting, students will be assigned a chapter from *Traditional Ecological Knowledge* for which they will be responsible. Prior to meeting each week, we will all read the chapter to be discussed that week. Students will facilitate discussion for their assigned chapter. After each weekly meeting, students will provide a written summary of the chapter and discussion. There will be one final term paper. We will also seek to invite some local guest speakers to explore their views on Indigenous perspectives and the environment. The final term paper will focus on student's own research or another

research/case study that currently does not include IK seeking how one might incorporate IK to complement Western scientific approaches.

**Course Grade Breakdown:**

- Participation in weekly chapter discussion (25%)
- Chapter presentation, discussion facilitation, and class participation (25%),
- Weekly chapter summary (1.25% per week - 15%)
- Term Paper connecting the teachings learned throughout the course to their own research (i.e. how they could meaningfully engage local Indigenous peoples and insights in a respectful and reciprocal way) or a research project currently only using western methods (35%)

**Learning Hours:**

- Weekly in-class chapter discussion (2hr x12 – 24hrs)
- Weekly reading prep time (3hr x12 – 36hrs)
- Chapter presentation prep time (6hrs x1 – 6hrs)
- Chapter presentation (1hr x1 – 1hr)
- Weekly chapter summary (30min x12 – 6hrs)
- Self-directed study – term paper (25hrs X 1 – 25hrs)

**Total hours = 98**

**Term Paper Guidelines**

We would like you to reflect back on your own thesis research or other research project that you are engaged in and explore how you would connect it to the teachings learned throughout the course. Your research project may not expressly be on something that, on first glance, lends itself to Indigenous perspectives but do remember the breadth and depth of local Indigenous knowledges and people. If your project is about environmental change in some way, then knowledge from local peoples will have rich troves of stories and insights that may expand your research empirically or relationally to other systems and species. If it is about particular plants or animals, there may be insights on behaviours, on population dynamics, on relations with other beings including people. You should begin of course by figuring out (if you do not already know) upon whose lands is your research being conducted? Which communities would you contact?

**Remember to embrace OCAP principles in your considerations:**
https://fnigc.ca/ocap-training/

Do recall that best practice is to build relationships with communities and to consult with them before embarking on and maintaining throughout your research – co-production of knowledge.

We'd recommend thinking about *Etuaptmumk* or two-eyed seeing in English (the ideas of Mi'kmaw Elders Murdena and Albert Marshall) or the wampums that Stafford alluded to in class as a framework. By all means, contemplate perspectives from *Braiding Sweetgrass - Indigenous Wisdom, Scientific Knowledge and the Teachings of Plants* by Robin Wall Kimmerer and the notion of braiding or weaving insights from different knowledge systems. Generally, we should avoid the notion of 'integration' as this implies lack of distinctiveness between the two.

Here are a few well cited papers (not the only way into this topic but one way):

Armitage et al. 2011. Co-management and the co-production of knowledge: Learning to adapt in Canada's Arctic. *Global Environmental Change*. 21: 995-1004.

Latulippe and Klenk. 2020. Making room and moving over: knowledge co-production, Indigenous knowledge sovereignty and the politics of global environmental change decision-making. Current Opinion in Environmental Sustainability. 42: 7-14.

**Format:**
In your essay 1) introduce us to your research question, why it is interesting and important, and how you are using specific Western biological fields to address it (e.g. limnology, genomics, modeling). 2) Discuss which aspects of Indigenous knowledge may be relevant to your research. Use examples from the book, articles, and news/webpages demonstrating this being done with other research or conservation efforts. 3) Explain how you could meaningfully engage local Indigenous peoples, build relationships, and seek their insights in a respectful and reciprocal way. 4) Finally,

discuss the expected outcomes of your research with and without Indigenous inclusion and how your research will benefit the Indigenous community and conservation / sustainability.

**Length and spacing**: 10-12 pages, double-spaced. 12 pt font. Times New Roman. 2 cm margins

**Contribution to final grade:** 35%

**Example (Note that this is simply an overview, and the expectation is a deeper exploration of your topic):**

Lake Sturgeon population decline following dam construction

1) Using palaeoecological and molecular ecology techniques I will determine the historical presence and abundance of lake sturgeon in the lake prior to and following the construction of a hydro dam.
2) The local Anishinaabe community has co-habited with other entities in the ecosystem for millennia and members have a deep, cultural relationship with lake sturgeon. Indigenous knowledge on the ecology, behaviour and relations of the local sturgeon will us help understand how they may have been impacted by the dam. Further oral traditions of sturgeon population decline coinciding with the dam may further the understanding of the timing of the population decline. Communities along the Mississippi advocated for the removal of a dam which was impeding the traditional spawning of salmon. Research commenced on the population and supported the claims of a once active spawning ground.

3) By contacting the community through their Environmental Program, we can begin to discuss what research would be most valuable to the community and how we can work together to complete the research. Building a relationship with experts we propose to further design a study the answers community empowered questions (can we recover the population to support traditional practices) with both western research and Indigenous knowledge.

4) Palaeo- and molecular data will provide an empirical time series of population metrics that support the decline and extirpation of sturgeon following the dam construction. Indigenous knowledge will provide historical ecological knowledge of the population and what impact the dam had. Further the co-produced knowledge may support removal of the dam and enhance spawning in traditional gravel beds that were once unavailable.