



UNIVERSITY OF  
CALGARY

# Institutional Sustainability Strategy

Integrated Framework for Education and Research on Sustainability



# Introduction

Many North American universities are now creating new academic programs around the idea of sustainability. For most, the objective of these programs is to produce students and faculty who will find the innovative solutions to grand challenges in the world today, including but not limited to human-environment interactions; environmental and climate change; population growth; food, water and energy systems; community health and well-being; and sustainable and equitable development. The University of Calgary aims to be a leader in sustainability, as prioritized in our 2012 Academic Plan, and this document outlines some formative steps toward achieving this goal.



We highlight below an Academic Framework for Sustainability for the University of Calgary to be implemented over the next five years. The University is already a national leader in many areas of research related to sustainability, but efforts are spread across multiple faculties and programs and are not well-integrated. We propose a framework for this integration that links education, research, outreach and engagement via an embedded curriculum. The objective is to integrate academic research with educational activities and operations and, in so doing, mobilize institutional resources to create programs with the potential to transcend conventional disciplinary boundaries. The Integrated Framework for Education and Research on Sustainability is one of three interdependent frameworks (the others being Operational and Engagement Frameworks) that collectively inform the overarching Institutional Sustainability Strategy.

The University of Calgary Sustainability Policy (2009) defines sustainability as it was first articulated in the Brundtland Report, “Our Common Future” (UNWCED 1987; see also University of Calgary 2011b). Sustainable development is “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” This is a very high-level framing of the concept, one that allows us to see the

fundamental principle clearly: that we ought to guide our contemporary actions with respect to the impacts that these actions will have on future generations of people.

What sustainability amounts to in different contexts requires consideration of more specific parameters: what sorts of future impacts should we consider, how far into the future should we project, what metric or scale of measurement is the most appropriate, and what specific actions will be most effective given our predictions? What we hope to foster through this initiative is a community where these issues will be addressed and where potential answers can in turn be tested, assessed, shared and modified at the highest level of academic rigour. Through a strong interdisciplinary program focused on an integrated approach to sustainability, we also hope to prepare students to contribute as working citizens to an environmentally healthy and equitable society, and to a socially just and sustainable community.

The University of Calgary is a particularly apt setting for this kind of sustainability initiative. The history and geography of Alberta and the mission and focus of the university converge to put us at the crux of many sustainability issues, in particular carbon-driven climate change, urbanization and land use, and vulnerable ecosystems.

Historically, the university has been deeply engaged in research on the discovery, extraction and delivery of carbon-intensive energy. The University of Calgary campus is located in the Bow River watershed, which is also home to a rapidly growing urban centre of more than 1 million people,<sup>1</sup> with all of the complex problems of land use, sprawl, density, transportation and energy use involved, combining to create both unique challenges and new research opportunities. At the same time, the province of Alberta is home to many and varied ecosystems currently at risk from increasing temperatures and unpredictable and extreme weather events. While addressing these risks is certainly a priority for the more populated regions of the province, more remote areas, particularly the Circumpolar North, are equally important. Our stewardship of these vulnerable lands makes it especially incumbent upon us, as a centre of learning and innovation, to take up sustainability research and education and to collectively find solutions to both existing and emerging social and ecological problems.





## The institutional commitment

The University of Calgary embraces sustainability as a core value. Sustainability is one of the key values listed in the *Eyes High* strategic vision and strategy (University of Calgary 2011a), is a priority in the University's Academic Plan (University of Calgary 2012a), and underpins priority research themes outlined in the Research Plan (University of Calgary, 2012b).

The University of Calgary is further committed to a model of sustainable practice on campus and to models of sustainable community development that link environmental stewardship and ecosystem health to economic, social and cultural stewardship, social justice, community health and well-being. The development of a functionally integrated, cross-disciplinary sustainability program for undergraduates reflects and enhances the university's commitment to sustainability as an academic priority. A sustainable institution functions as a sustainable community through the responsible use of energy, water and food, natural resources and the protection of

ecosystem services, and promotes individual and community health and well-being by supporting sustainable development in local urban and rural communities and across the region (USLF 2008).

The University of Calgary has a clear commitment to excellence and leadership in advancing sustainability studies. The University is also signatory to the University and College Presidents' Climate Change Statement of Action for Canada, the Talloires Declaration, and is a partner in the imagineCALGARY initiative, and this is only one of several long-range visions for the City of Calgary to build a more sustainable community.

The Academic Committee for Sustainability (ACS) was formed in 2012 and an Academic Coordinator was appointed in 2013. The ACS has been charged with conceptualizing a new academic strategy and vision for research and education in sustainability. The committee is comprised of faculty members representing multiple disciplines and programs, including the social and natural sciences, the biomedical sciences, education, environmental design, law, business, engineering, social work, communication and culture, philosophy and religious studies (Appendix 1).

Formally appointed representatives from key undergraduate and graduate student organizations also participate.

The institutional motivation for forming the committee was expressed early in the 2009 Sustainability Policy: "The University of Calgary is committed to excellence and leadership in advancing the pursuit of sustainability, teaching, research, campus operations and community service." Two themes that consistently emerged from the 2013/2014 ACS discussions about a new sustainability programming initiative are: (1) that we need to motivate change from the bottom up as well as from the top down, and (2) that in order to effectively do this we need to identify and transcend institutional barriers that limit cross-disciplinary interaction and collaboration in teaching and research.

<sup>1</sup> *Rapid urbanization and changes in land use are pressing issues facing the City of Calgary, specifically, and the Province of Alberta, more generally. For example, the federal government (Canadian Forest Services) has recently featured a 23-year study which demonstrates that the Calgary-Edmonton corridor has witnessed relatively intensive urbanization (including suburban), primarily achieved through the conversion of arable farm land, moving from roughly 2.5% growth in 1988 to roughly 6.6% in 2010. Projections indicate that urban sprawl/expansion, assuming continued, comparable rates to those noted for 2010, could range anywhere between 39-75% growth by 2036 (Martellozzo et al. 2014).*



## Sustainability education and research at the University of Calgary now

The University of Calgary is a member of the Association for the Advancement of Sustainability in Higher Education (AASHE) and also participates in the Sustainability Tracking, Assessment & Rating System (STARS) initiative, a tool used by institutions to measure performance in operational sustainability, as well as in education, research and integration. According to STARS system measures alone, our university ranks very high in the area of sustainable campus operations, but less so in the other categories, specifically those linked to the educational and research components.

The University of Calgary already hosts substantial activities for sustainability research and education. At least 250 faculty members from 27 of 65 academic departments are engaged in research and teaching that directly or indirectly advances knowledge about sustainability. Sustainability courses currently fall into one of two categories: sustainability-focused courses and sustainability-related courses. Sustainability-focused courses concentrate on sustainability concepts, including the social, economic and environmental dimensions, or they explore an issue or topic using sustainability and systems thinking as the focus. Sustainability-related courses incorporate sustainability as a key course component, or concentrate on a single problem area and/or on a larger debate around the sustainability concept. The sustainability-related courses complement the focused courses by providing students with in-depth knowledge of a particular dimension of sustainability (e.g., the natural environment), or by focusing on a particular problem area such as renewable energy or human-environment interactions.



From the more than 10,000 courses currently offered over a four-semester academic calendar, an estimated 350 are related to or are specifically focused on sustainability in some form or another (see Appendix 2 for a listing of courses as of 2012–2013). The Academic Committee for Sustainability continues to reach out to disciplines, departments, programs and faculties for an update of existing and/or new courses related to sustainability. During the 2013/2014 academic year a request for information about existing and new sustainability courses went out to more than 50 department heads, disciplines and faculties across campus. The University of Calgary offers several formal graduate degree options in some aspect of sustainability, but there is no parallel concentration at the undergraduate level. Other sustainability options for undergraduates include co-curricular activities, where participating students are eligible to receive credit through their Co-Curricular Record, an official university document that formally records a student's "out of classroom" experience.

What is lacking, however, is an integration of strengths, a coordinated approach that will allow the university to take advantage of our operational prowess by integrating research with pedagogical opportunities. The embedded certificate program proposed

below is a first step toward this goal. The Sustainability Studies Certificate Program that we propose requires credits in course work, lab work and a mid-level and capstone course with a research project component. This embedded certificate is compatible with any major and is potentially relevant to all faculties.

By encouraging different fields of study to focus on the independent values and practices of sustainability science and/or sustainability studies, the embedded certificate program takes advantage of broad-ranging concepts in sustainability, and does so by employing the expertise of scholars and scientists already engaged in education for sustainability at the University of Calgary. Concentrated course and laboratory work, as shaped and defined by the different departments and schools, will serve to produce professionals, scientists, scholars and other public leaders with situated, concrete expertise in sustainability issues, as well as provide a knowledge of the history and theoretical framework of sustainability. As outlined in the following section, the overarching objective is to integrate existing approaches within the university, to embed sustainability values and practices across the campus and into the community, and to further integrate sustainability in operations (e.g., buildings, services, energy consumption, etc.) with education and research.



# Academic Framework For Sustainability

## Where Are We Going?

The core emphasis of the Integrated Framework for Education and Research on Sustainability is on building an integrated educational and research program to fill the gap described above. We have a solid foundation of existing courses in sustainability, a plan to develop at least two new courses, and it is clear that there are interested and committed faculty and students. What we are working to create is an integrated framework that will provide structure for such a program and that will make sustainability a visible and accessible component of education and research. This program is designed to blur traditional intellectual and disciplinary boundaries and to challenge familiar assumptions through critical analysis and problem solving.

The general components of this programming initiative in sustainability studies are described below, but to briefly summarize, the emphasis is on: (1) creation of an embedded Sustainability Studies Certificate Program; (2) promoting new approaches to the integration of research and education through curricular and co-curricular activities; (3) creating working communities of practice to engage interdisciplinary faculty in the team teaching of courses in sustainability; (4) expanding research opportunities for undergraduates; (5) finding new and innovative ways to engage the broader community of Calgary and the surrounding area through the introduction of existing and new research activities that are relevant to community concerns and needs; (6) engaging external corporate and business communities in University of Calgary activities that are situated in a context of sustainable business and development practices; and (7) by creating new educational and research opportunities through direct engagement and outreach activities to rural and urban community stakeholders.

## I. ADVANCING SUSTAINABILITY EDUCATION

There is no single solution to the goal of advancing sustainability in higher education that will work in all places and at all times. Approaches to achieving this goal are place-based, culturally situated, institutionally specific, dynamic and iterative.

General goals and strategies are described below:

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### Goal I.1: To establish an undergraduate embedded certificate program in sustainability studies.

The objective is to define undergraduate programs of study in sustainability and to specify a suite of course offerings that provide the opportunity for interested undergraduate students to be exposed to courses with a sustainability focus or content early in their University of Calgary experience. This value-added component promotes opportunities for students to graduate as sustainability literate and fully aware of the contemporary problems facing society today at local, regional and global levels and scales; we will graduate students who have a sophisticated understanding of the complex nature of the

solutions needed to contribute positively to the resolution of contemporary issues.

We propose that a first step in the process of developing interdisciplinary educational programming in sustainability can begin with an embedded undergraduate Sustainability Studies Certificate Program. The Sustainability Studies Certificate Program will be structured around 'natural groupings' of courses with sustainability content or focus—courses that a student chooses at their discretion or, ideally, in consultation with a participating faculty advisor. The total number of credit hours required to successfully complete the program will be developed in accordance with university criteria. Disciplinary and/or interdisciplinary course selections will depend on student interest and long-term personal and career goals. This part of the model makes use of existing resources, provides flexibility for students, and is embedded in existing degree programs. This is a value-added component that benefits both existing degree programs and students with specific interests. It also provides the student with a recognizable and visible university credential and this is an advantage for students who have only a minor or a concentration at the time of graduation.

To provide additional structure for the program and to create a working cohort of students engaged in sustainability studies from different disciplinary perspectives, we also propose the following: (1) a required introductory course in Sustainability Theory and Practice; (2) a year-long mid-point course where students define problems and design a research project; and (3) a capstone course where students revisit theory and practice and finalize their projects through completion of a written manuscript that conforms to disciplinary and/or interdisciplinary expectations and standards. The emphasis in the capstone course is on applied problem solving. These three required courses are designed to provide structure and to enhance program rigour and to complement the 'natural course groupings' model of course selection. The Sustainability Studies Certificate Program will be embedded within a student's discipline and degree program of choice. The details for the specifics about programmatic structure will be developed in the next phase, Implementation, and this will begin in fall 2015.



## Strategies

- I.1.1 Define natural groupings of sustainability courses that will comprise a satisfactory Sustainability Studies Certificate Program;
- I.1.2 Develop proposals for Sustainability Certificates that will form an integrated program of study;
- I.1.3 Work with faculty to determine the potential research areas that will link the academic strategy to operations through experiential learning;
- I.1.4 Create experiential learning opportunities by working with faculty members to determine links between academic sustainability opportunities and those that exist in operations;
- I.1.5 Develop formal and informal learning opportunities in sustainability using existing courses and resources offered in all departments and on campus programs.

## II. INTEGRATING RESEARCH AND EDUCATION IN SUSTAINABILITY

A key theme of the general proposal for a new initiative in sustainability programming is to forge stronger linkages at the undergraduate level among research activities and formal curricular and co-curricular activities. In order to accomplish this, we propose to further develop the campus as a living research and educational laboratory. This creates a framework for students to directly engage in the practical aspects of research in sustainability through a combination of participation in a formal curriculum, co-curricular activities, and direct research experience.

This approach should help build the bridge between academic and operational activities and creates an educational model that promotes experiential learning and creatively uses existing and new educational resources and infrastructure as active, experimental environments for interdisciplinary learning, applied research and practice. Experiential learning inspires personal and social action in ways that a formal classroom experience cannot always do, and it encourages students to apply theory and practice in equal measure.

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### Goal II.1: To create an institutional environment that engages students and faculty in all aspects of interdisciplinary research in sustainability.

In order to achieve this cross-disciplinary engagement, faculty communication and collaboration will be required, particularly in creating active communities of practice and expanding team teaching approaches in the classroom. We are in a position to utilize models whereby scholars from multiple disciplines explore different topics in sustainability through the delivery of a formal curriculum and through applied research activities that actively engage undergraduate students.

## Strategies

- II.2.1 Identify thematically situated research themes in the social and natural sciences, the arts and humanities, business, the biomedical sciences, education, and in all disciplines with an interest in education for sustainability;

- II.2.2 Promote faculty interaction with undergraduate students through informal seminars, formal and informal introductions to ongoing research activities, laboratory tours and demonstrations, field trips, and direct experience in research activities;
- II.2.3 Promote opportunities for undergraduate students to actively engage with faculty from other universities, particularly faculty who collaborate as interdisciplinary partners on sustainability-related research teams with faculty from the University of Calgary. This will broaden and enhance student exposure to alternative ways of thinking, introduce them to other institutional cultures, and familiarize them with the value of “networking” as they advance in their education and future careers.

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## Goal II.2: To promote the university as a national leader in sustainability research and education.

This requires creation of an institutional environment and culture where research in sustainability is recognized and rewarded at all levels of faculty review.

### Strategies

- II.2.1 Work to improve the capacity for faculty to offer interdisciplinary courses that are team taught in collaborative and synergistic ways, and to promote the formal recognition of interdisciplinary education by the university;
- II.2.2 Work to promote cross-disciplinary faculty collaboration through formal research activities related to sustainability;
- II.2.3 Work to highlight the relevance of existing and new research activities at the University of Calgary for addressing local, national and international needs and concerns, and to actively engage undergraduate students in activities related to this research.

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## Goal II.3: To promote a research and educational portfolio that more actively engages faculty and students in a well-integrated combination of co-curricular and formal research activities.

This provides an additional avenue for research, creates a complementary model for education and outreach, and provides faculty with expanded opportunities for external research funding. Furthermore, it contributes in important ways to enhance experiential and formal learning.

### Strategies

- II.3.1 Promote and expand opportunities for undergraduate students to engage in research activities on-campus and throughout the broader community of Calgary. This is a component of the proposed Sustainability Studies Certificate Program in particular, broader sustainability programming initiatives in general, and is designed to broaden the undergraduate educational experience;



- II.3.2 Promote student research activities through formal acknowledgement of these activities through recognition and awards, scholarships, and opportunities for internships and specialized but advanced research activities that go beyond what is formally required through the co-curricular model;
- II.3.3 Identify and promote research opportunities in the many ongoing sustainability activities in the operations group, including, for example, the energy management strategy or the co-generation facility, to name but two possibilities.

### III. ENGAGING FACULTY, STUDENTS AND COMMUNITY IN SUSTAINABILITY

Successful sustainability programming initiatives on college and university campuses have been driven from the grassroots, or from the bottom up, sometimes with higher-level institutional support and sometimes without such support. We have the high-level administrative support at the University of Calgary and we have the student interest, but we lack the integrated framework needed to create a cohesive and functional working community of practice focused on issues of sustainability at the

“grassroots” level. The proposal for a Sustainability Studies Certificate Program is one way to begin to close this gap. Meaningful and ongoing engagement at all levels is key if we are to be successful.

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**Goal III.1:** To promote meaningful engagement among faculty and students across the university in all aspects of sustainability, and to link this to the active development of active communities of practice.

#### Strategies

- III.1.1 Improve communication and collaboration across disciplinary lines through face-to-face interactions in the classroom, on research projects, through workshops and panel discussions, and through development of a formal speaker series. Faculty and students must collaborate for this to be successful, and collaboration is essential for all parties involved to be sufficiently invested in successful outcomes.

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**Goal III.2:** To more directly engage the City of Calgary, the broader community around Calgary, and the Province of Alberta, including the private sector.

Engagement pertains to sustainability activities currently planned and/or underway, and ongoing communication is necessary to determine the best fit for community needs for research related to sustainability. Undergraduates, graduate students, faculty and staff must be involved in order to improve and strengthen collaborative communication and research relationships with multiple entities and organizations. This will increase the visibility of what the University of Calgary has to offer with respect to faculty expertise, and to make clear that we have the capacity to respond to local, provincial, national and international needs in effective ways.





## Strategies

- III.2.1 Utilize the Sustainability Studies Certificate Program as a way to organize community outreach activities and a community speaker series to feature research projects that are of direct relevance to issues facing rural and urban communities today. The intent is to expose students to multiple faculties and research programs and multiple ideas and perspectives, both disciplinary and interdisciplinary;
- III.2.2 Work with the broader Calgary community to form working partnerships for collaborative research initiatives that will enhance research at the University of Calgary, serve the needs of the City of Calgary and surrounding communities, and enhance the undergraduate educational experience;
- III.2.3 Form working partnerships with municipalities, nonprofit organizations and entities to create internship opportunities for undergraduates to engage in community-based service work, active research projects, and community coalition building as part of their undergraduate educational experience.

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## Goal III.3: To develop collaborative partnerships for research and education with Aboriginal<sup>2</sup> groups and communities.

Developing partnerships in this area can be achieved through the offering of regular field schools and educational experiences in rural and urban areas, and through development of working educational partnerships that both serve community needs and position the University of Calgary as a leader in this area. There are natural linkages here to the emerging fields of Indigenous Studies, Indigenous education, and the existing degree program in Development Studies, including a focus on international as well as national development studies. The Aboriginal engagement component of the Integrated Framework for Education and Research on Sustainability will be developed in concert with the Aboriginal engagement initiative currently underway in the Faculty of Arts, as well as with similar initiatives being undertaken in the Werklund School of Education, the Haskayne School of Business, and at the university-wide level.

<sup>2</sup> For the purpose of this report, "Aboriginal" includes First Nations, Inuit and Métis peoples (Aboriginal Affairs and Northern Development Canada 2011).

## Strategies

- III.3.1 Form active and fully engaged collaborative partnerships with Aboriginal communities to identify their research strengths and needs, and to work directly with them to identify funding streams that will support research to enhance and share these areas of strength;
- III.3.2 Create a Summer Research Academy and internships that provides opportunities for rural and urban Aboriginal students to attend the University of Calgary campus to work with students and faculty in any one of the sustainability programming initiatives. This includes the Sustainability Studies Certificate Program, work with graduate students and/or faculty with specialized expertise in some aspect of sustainability, and the opportunity to experience and engage with our university campus.



# References



## Aboriginal Affairs and Northern Development Canada

- 2011 *Fact Sheet: 2011 National Household Survey Aboriginal Demographics, Educational Attainment and Labour Market Outcomes.*  
Electronic document: [aadnc-aandc.gc.ca/eng/1376329205785/1376329233875](http://aadnc-aandc.gc.ca/eng/1376329205785/1376329233875)

## Martellozzo, Federico, Navin Ramankutty, Ron J. Hall, David T. Price, Brett Purdy, and Mark A. Friedl

- 2014 Urbanization and the Loss of Prime Farmland: A Case Study in the Calgary-Edmonton Corridor of Alberta. *Regional Environmental Change*. DOI: 10.1007/s10113-014-0658-0  
Electronic document: [link.springer.com/article/10.1007%2Fs10113-014-0658-0](http://link.springer.com/article/10.1007%2Fs10113-014-0658-0)

## United Nations World Commission on Environment and Development (UNWCED)

- 1987 Report of the World Commission on Environment and Development: Our Common Future.  
Electronic document: [un-documents.net/our-common-future.pdf](http://un-documents.net/our-common-future.pdf)

## University of Calgary

- 2009 Sustainability Policy.  
Electronic document: [ucalgary.ca/policies/files/policies/Sustainability%20Policy.pdf](http://ucalgary.ca/policies/files/policies/Sustainability%20Policy.pdf)
- 2011a *Eyes High: University of Calgary 2011 Vision and Strategy.*
- 2011b *Stepping up Together: Institutional Sustainability Plan*, 1-39.  
The University of Calgary, Calgary, AB.
- 2012a *University of Calgary 2012 Academic Plan*. 1-47.
- 2012b *University of Calgary 2012 Strategic Research Plan.*

## University Leaders for a Sustainable Future (USLF)

- 2008 *About USLF*. Electronic document: [ulsf.org/about.html](http://ulsf.org/about.html)

# Appendix 1:





## Academic Committee on Sustainability (ACS) Membership 2014-2015

Barker, Susan	<i>Student and Enrolment Services</i>
Campbell-Arvai, Victoria	<i>Department of Geography</i>
Carter, Ralph Victor	<i>Department of Biological Sciences</i>
Draper, Dianne	<i>Department of Geography</i>
Eggermont, Marjan	<i>Schulich School of Engineering</i>
Feng, Patrick	<i>Department of Communication &amp; Culture</i>
Gerlach, Craig	<i>Department of Anthropology and Archaeology</i>
Habib, Allen	<i>Department of Philosophy</i>
Hedges, Peggy	<i>Haskayne School of Business</i>
Herremans, Irene	<i>Haskayne School of Business</i>
Hettiaratchi, Joseph Patrick	<i>Schulich School of Engineering</i>
Jackson, Leland	<i>Department of Biological Sciences</i>
Jardine, Gail	<i>Werklund School of Education</i>
Kadri, Hana	<i>Students' Union</i>
Keough, Noel	<i>Faculty of Environmental Design</i>
Lowan-Trudeau, Greg	<i>Werklund School of Education</i>
Marshall, Dru	<i>Provost and Vice-President (Academic)</i>
McLaren, Lindsay	<i>Department of Community Health</i>
Ngo, Van Hieu	<i>Faculty of Social Work</i>
O'Rae, Amanda	<i>Faculty of Nursing</i>
Perdue, Joanne	<i>Chief Sustainability Officer</i>
Shapiro, Bonnie	<i>Werklund School of Education</i>
Sinclair, Brian	<i>Faculty of Environmental Design</i>
Smith-Watkins, Heather (Admin)	<i>Office of the Provost</i>
Webster, Mike	<i>Graduate Students' Association</i>
White, Anne	<i>Department of Religious Studies</i>



# Appendix 2:





# University of Calgary

## Sustainability Course List

For most current course listing, visit [ucalgary.ca/sustainability/courses](http://ucalgary.ca/sustainability/courses)

### Faculty of Arts

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#### African Studies

AFST 501: Interdisciplinary Seminar

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#### Anthropology and Archeology

ANTH 213: Contemporary Aboriginal Issues in Canada  
ANTH 303: Business in Cultural Context  
ANTH 313: Anthropology of the Environment  
ANTH 341: Medical Anthropology  
ANTH 343: Militarism and Militarization  
ANTH 349: Anthropology of HIV/AIDS  
ANTH 355: An Ethnographic Survey of Native North America  
ANTH 357: Anthropology of Development  
ANTH 363: Magic, Witchcraft, and Gods: Anthropology of Religion  
ANTH 371: Political Anthropology  
ANTH 379: Urban Anthropology  
ANTH 385: Economic Anthropology  
ANTH 393: Ethnography of Global-Local Dynamics  
ANTH 399: Comparative Farming and Sustainable Food Systems  
ANTH 405: Ecology of Tropical Forest Societies  
ANTH 421: Contemporary Latin American Society  
ANTH 427: Women in East Asian Societies  
ANTH 441: Problems in the Anthropology of Health  
ANTH 479: Housing and Society  
ANTH 523: Human Ecology  
ANTH/ARKY 589: Nutritional Anthropology  
ANTH 641: Seminar in Civil-Military Relations  
ARKY 423: Archaeology of the Arctic  
ARKY 439: African Complex Societies  
ARKY 591: Landscape Archaeology

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#### Canadian Studies

CNST 361: Gender, Race and Ethnicity in Canada  
CNST 591: Senior Seminar in Canadian Studies

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#### Classics and Religion

RELS 343: Religion and Social Morality  
RELS 397: Religion and Science  
RELS 398: Religion and the Environment

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#### Communication, Media and Film

COMS 393: Critical Perspectives on Health and Science  
COMS 477: Food Culture and Communication  
COMS 623: Social Contexts of Science and Technology  
COMS 631: Social and Media Activism  
COMS 711.68: Indigenous Media Activism  
CMCL 617: Heritage and Identity - Issues and Approaches  
STAS 325: Technology Within Contemporary Society  
STAS 327: Science in Society

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#### Development Studies

DEST 201: Introduction to Development Studies  
DEST 375: Gender and Development  
DEST 393: Theories and Applications of Development  
DEST 400: Field School  
DEST 401.3: Politics and Economics of Development  
DEST 403: Sustainability and Human Ecology in the Circumpolar Arctic  
DEST 405: Environment and Development  
DEST 485: International and Intercultural Communication  
DEST 501.1: Theories of Development Policy  
DEST 591: Critical Perspectives on Development Practice and Research  
DEST 593: Current Theoretical and Methodological Issues

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## Economics

ECON 209: Engineering Economics  
ECON 321: The Global Trading System  
ECON 337: Development Economics  
ECON 349: The Economics of Social Problems  
ECON 367: Agricultural Economics  
ECON 377: Economics of the Environment  
ECON 379: The Economics of Health  
ECON 427: Energy Economics and Policy  
ECON 473: Water Resource Economics and Policy  
ECON 475: Economics of Natural Resources  
ECON 487: Environmental Economics  
ECON 527: World Oil Economics  
ECON 619: Empirical International Trade  
ECON 621: International Trade  
ECON 675: Natural Resource Economics  
ECON 677: Environmental Economics  
ECON 679: Health Economics  
ECON 723: Trade, Growth and the Environment I  
ECON 725: Trade, Growth and the Environment II

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## English

ENGL 302: Foundations: Introductions to Contemporary Theoretical Practices  
ENGL 383.7: Introduction to Ecocriticism and Nature Writing  
ENGL 384: Topic in Women's Literature  
ENGL 385: Topic in Aboriginal Literatures  
ENGL 387.99: Encountering Cultural Others  
ENGL 391: Topic in Postcolonial Literature and Theory  
ENGL 515: Postcolonial Studies

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## Geography

GEOG 205: Gateway to Geography  
GEOG 213: Geography of World Affairs  
GEOG 251: The Human Environment  
GEOG 253: Introduction to Cities  
GEOG 311: Natural Events and Human Disasters  
GEOG 317: Animal Geography  
GEOG 321: Geography and Our Environment  
GEOG 340: Qualitative Methods in Human-Environmental Research

GEOG 341: Introduction to Economic Geography  
GEOG 351: Urban Social Geography  
GEOG 365: Political Geography  
GEOG 367: Population Geography  
GEOG 397: Regional Geography of Selected World Areas  
GEOG 403: Physical Oceanography and Climatic Variability  
GEOG 407: Wind Science  
GEOG 411: Fluvial Geomorphology  
GEOG 413: Soil Characteristics and Formation  
GEOG 415: Hydrology  
GEOG 417: Biogeography and Natural Ecosystems  
GEOG 421: Renewable Resources and Natural Environments  
GEOG 425: Critical Approaches to Development: Theory and Applications  
GEOG 429: Tourism, Recreation, and Environmental Management  
GEOG 451: Urban Systems Development  
GEOG 457: Geographic Information Systems II  
GEOG 463: Cities, Poverty and Development  
GEOG 465: Science, Nature and Politics  
GEOG 503: Climate Change  
GEOG 516: Ecohydrology  
GEOG 517: Conservation GIS  
GEOG 519: Landscape Ecology  
GEOG 521: The Urban Environment  
GEOG 522: Topics in Politics of the Environment  
GEOG 523: Human Ecology  
GEOG 529: Research and Planning for Tourism and Recreation Resources  
GEOG 531: Field Studies in Remote Sensing and Natural Resource Management  
GEOG 537: Field Studies in GIS and Natural Resource Management  
GEOG 545: The Politics of the Environment  
GEOG 553: Globalization and the City  
GEOG 565: Urban Political Geography  
GEOG 575: The Geography of HIV/AIDS  
GEOG 619: Spatial Ecology  
GEOG 621: The Politics of the Environment  
GEOG 685: Arctic System Science  
GEOG 691: Advanced Fluvial Geomorphology  
GEOG 696: Urban, Regional and Global Political Economy Seminar

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## History

HTST 307: The Contemporary World  
HTST 345: Canadian Native History  
HTST 354: Landscape, Settlement and Cities in Global History  
HTST 357: Wild West/Mild West?: Comparative History of the U.S. and Canadian Wests  
HTST 395: History of Energy: From Fire to Fossil Fuels and Beyond  
HTST 437: Canadian Environmental History  
HTST 447: Northern Horizons: Subarctic and Arctic Canadian History (formerly HTST 352)  
HTST 493.38: History of Medicine and Health Care I  
HTST 493.39: History of Medicine and Health Care II  
HTST 493.36: Gender and Sexuality in the Western World  
HTST 528: Exchange, Trade, and Cultural Encounter in North America  
HTST 529: Topics in Native History  
HTST 593.26: Selected Topics in History - The 1970s Energy Crises  
HTST 675.4: Environmental History: Themes in Power, Imperialism and Military History

## Indigenous Studies

INDG 303: Indigenous Ways of Knowing I  
INDG 305: Indigenous Ways of Knowing II  
INDG 311: Indigenous Governance  
INDG 317: Indigenous Perspectives on Holistic Science  
INDG 397: Special Topics  
INDG 399: Special Topics: International  
INDG 407: Comparative International Indigenous Communities  
INDG 415: Indigenous Ethics and Protocol  
INDG 502.01: Indigenous Awareness: Canadian Issues  
INDG 503: Selected Topics in International Indigenous Studies

## International Relations

INTR 301: A Multidisciplinary Survey of International Relations

## Latin American Studies

LAST 311: Critical Contemporary Issues in Latin American Studies

## Law & Society

LWSO 415: Socio-legal Issues in Contemporary Liberal Societies  
LWSO 425: Law and Technology

## Philosophy

PHIL 275: Scientific and Critical Reasoning  
PHIL 313: Bioethics  
PHIL 345: Issues in Environmental Ethics  
PHIL 347: Contemporary Moral Problems

## Political Science

POLI 279: Politics of the Global South  
POLI 283: Issues and Trends In World Politics  
POLI 381: Introduction to International Relations  
POLI 405: Biopolitics  
POLI 431: Political Parties and Interest Groups  
POLI 447: Comparative Public Policy  
POLI 453: Women and Politics  
POLI 463: Politics of Post-Industrial States  
POLI 470: Genocide, Justice, and Reconciliation  
POLI 471: Africa: Contemporary Political Problems  
POLI 473: Latin American Politics  
POLI 479: International Relations of the Contemporary Arab World  
POLI 483: Experiential Learning  
POLI 485: The Politics of the International Economic Order  
POLI 487: International Organizations  
POLI 523: Canada and Circumpolar World  
POLI 554: Women and Public Policy  
POLI 571: The Politics of Human Rights  
POLI 579: Political Economy of Development  
POLI 585: Nonproliferation Regimes  
POLI 587: International Ethics  
POLI 619: War and Interpretation  
POLI 653: Gender and Public Policy



POLI 675.31: Selected Topics in Advanced Comparative Politics – Energy Policy  
 POLI 681: Advanced Analysis of International Relations  
 POLI 683: Advanced Studies in Foreign Policy  
 POLI 684: Human Rights and Humanitarianism  
 POLI 687: Advanced Studies in Canadian Arctic Security  
 POLI 755.31: Environmental Policy Analysis

### Psychology

PSYC 330: Health Psychology  
 PSYC 427: Environmental Psychology

### Sociology

SOCI 307: Sociology of First Nations in Canada  
 SOCI 321: Sociology of Health and Illness  
 SOCI 353: Urban Sociology  
 SOCI 375: Sociology of Ethnicity and Racialization  
 SOCI 409: Social Determinants of Health  
 SOCI 453: Special Topics in Urban Sociology  
 SOCI 475.5: Special Topics in Race and Ethnic Relations  
 SOCI 487: Sociology of Development

### Urban Studies

UBST 311: The Gendered City  
 UBST 451: Planning in the Canadian City  
 UBST 461: The Transit City  
 UBST 591: Capstone in Urban Studies

### Women's Studies

WMST 301.01 Global Feminisms  
 WMST 301.03: Social Issues and Gender – Gender and Leadership  
 WMST 301.04 Women and Health

## Faculty of Environmental Design

### Environmental Design

EVDS 401: Introduction to Environmental Design  
 EVDS 501: Interdisciplinary Seminar  
 EVDS 523: Sustainability in the Built Environment  
 EVDS 583.6: Special Topics in Environmental Design: The Fuss over Fracking  
 EVDS 601: Interdisciplinary Seminar  
 EVDS 611: GIS for Environmental Design  
 EVDS 616: Urban Transportation, Infrastructure and Land Use  
 EVDS 618: Urban Design Studio  
 EVDS 621: Health in the Built Environment  
 EVDS 623: Regional Planning Studio  
 EVDS 624: Impact Assessment and Risk Management  
 EVDS 626: Landscape Planning and Ecological Design  
 EVDS 643: Field Studies  
 EVDS 671: Urban Design Theory  
 EVDS 675: Urban Systems  
 EVDS 683.60: Solar Building Envelope Design – Renewable Technology  
 EVDS 683.66: Theory in Planning  
 EVDS 683.68: Sustainable Housing  
 EVDS 683.74: Sustainable Cities (Block Course)  
 EVDS 683.85: Lifecycle Assessment  
 EVDS 723.02: Sustainable Futures and Planning Scenarios  
 EVDS 753: Research Skills and Critical Thinking

### Architectural Studies

ARST 423: Sustainability in the Built Environment  
 ARST 483: Interdisciplinary Seminar

### EVDS - Architecture

EVDA 580: Studio One: Design Thinking  
 EVDA 615: Environmental Control Systems  
 EVDA 617: Architectural Lighting Design  
 EVDA 682.02: Intermediate Studio - Impact of Human Construction on Global Ecosystems (and vice versa).  
 EVDA 682.04: Comprehensive Design Studio - Ecologies of Technology  
 EVDA 683.02: Intermediate Studio - Sustainable Buildings for Cold Climates

### EVDS - Planning

EVDP 623: Regional Planning and Land Use Management  
EVDP 626: Landscape Ecology and Planning  
EVDP 631: Planning and Public Engagement  
EVDP 637: Community Planning

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## Faculty of Science

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### Biological Sciences

BIOL 307: Ecology and Human Affairs  
BIOL 309: Plants and People  
BIOL 313: Principles of Ecology  
BIOL 375: Insects, Science and Society  
BIOL 451: Conservation Biology  
BIOL 453: Plants in their Environment  
BIOL 505: Medicinal Plant Biochemistry  
CMMB 543: Environmental Microbiology  
ECOL 413: Field Course in Ecology  
ECOL 417: Aquatic Communities and Ecosystems  
ECOL 439: Ecology of Populations  
MSRC 312: Introduction to Marine Science  
MSRC 525: Ecological Adaptations of Seaweeds  
PLBI 401: Plant Biotechnology  
ZOO 528A.45: Independent Studies in Zoology (Landscape & Biodiversity)  
ZOO 528B.45: Independent Studies in Zoology (Landscape & Biodiversity)

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### Chemistry

CHEM 321: Environmental Chemistry  
CHEM 423: Green Chemistry: Principles and Techniques  
CHEM 521: Introduction to Atmospheric Chemistry

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### Geoscience

GLGY 202: Applications of Geoscience  
GOPH 375: Natural Disasters and Critical Earth Phenomenon

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### Natural Sciences

SCIE 403: Science in Society  
SCIE 521: Principles of Solar Energy  
SCIE 525: Principles of Wave and Wind Energy  
SCIE 529: Project Course in Sustainable Energy, Environment and Economy  
SCIE 531: Principles of Hydroelectric Energy  
SCIE 533: Principles of Geothermal Energy

### Physics & Astronomy

PHYS 371: Introduction to Energy

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## Schulich School of Engineering

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### Biomedical Engineering

BMEN 619.09: Special Topics in Biomedical Engineering - Biomimetics

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### Chemical & Petroleum Eng.

ENCH 643: Air Pollution Control Engineering

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### Civil Engineering

ENCI 481: Environmental Engineering  
ENCI 502: Civil Engineering Aspects of Sustainable Communities  
ENCI 506: Sustainable Infrastructure  
ENCI 508: Environmental Aspects of Energy  
ENCI 645: Risk Analysis  
TRAN 473: Introduction to Transportation Planning

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### Electrical & Computer Engineering

ENEL 581: Renewable Energy and Solid State Lighting for Human Development  
ENEL 661: Grid-Connected Inverters for Alternate Energy Systems  
ENEL 669: Renewable Energy and Solid State Lighting for the Developing World

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## Energy & Environment

ENEE 355: Introduction to Energy and the Environment  
ENEE 503: Life Cycle Assessment  
ENEE 519.09: Special Topics - Biomimetics  
ENEE 573: Engineering Aspect of Sustainable Communities  
ENEE 575: Alternative Energy Systems  
EESS 601: Introduction to Energy and Environmental Systems  
ENEN 671: Energy and Environment  
ENEN 691: Environmental Policy Analysis  
ENEN 693: Lifecycle Assessment

## Engineering

ENGG 481: Technology and Society

## Geomatics Engineering

ENGO 581: Land Use Planning  
ENGO 583: Environmental Modelling  
ENGO/ENEN 637: Earth Observation for the Environment

## Mechanical Manufacturing & Manufacturing Engineering

ENME 539: Energy Systems  
ENME 583: Mechanical Systems in Buildings  
ENME 619.56: Special Problems - Introduction to Biomimicry  
ENME 629: Fuel Science and Technology  
ENME 637: Thermal Systems Analysis

## Haskayne School of Business

### Business & Environment

BSEN 749: Rediscovering Leadership - The Haskayne Wilderness Retreat  
BSEN 751: Strategies for Sustainable Development

### Energy Management

ENMG 489: International Energy Development

### Strategy & Global Management

MGST 597.17: Indigenous Peoples and Sustainable Development  
MGST 797.19: Renewable Energy Impacts

## Tourism Management

TOUR 449: Policy Planning and Research in Tourism  
TOUR 741: Policy Planning and Development in Tourism

## Faculty of Law

### Law

LAW 529: Biotechnology and the Law  
LAW 563: International Human Rights and Humanitarian Law  
LAW 583: Water Law  
LAW 597: International Trade Law  
LAW 617: Alternate Energy Law  
LAW 626: International Development Law  
LAW 627: International Environmental Law  
LAW 634: Law of Species and Spaces  
LAW 705: Seminar in Legal Theory - Natural Resources, Energy, and Environmental Law

## Werklund School of Education

### Educational Research

EDER 613: Change and Innovation  
EDER 651.29: Sustainability in the Workplace  
EDER 689.12: Aspects of School Curriculum - Curricular Integration of Outdoor Education  
EDER 689.47: Aspects of School Curriculum - Storied Affinities: Ecology, Hermeneutics, Buddhism  
EDER 689.95: Aspects of School Curriculum - On Ecological Consciousness and Classroom Practice  
EDER 689.96: Aspects of School Curriculum - The Story of the Ecological Heart of Consciousness



## Cumming School of Medicine

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<b>Community Health Sciences</b>	MDCH 601: Determinants of Health MDCH 666: Health Policy MDCH 680: Foundations of Population/Public Health MDCH 687: Environmental Health MDCH 689: Global Health and Development MDCH 780: Advanced Topics in Population/Public Health
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<b>Community Rehabilitation &amp; Disability</b>	CORE 545: Bioethics and Disability CORE 547: Health Research, Emerging Technologies and Marginalized Groups CORE 654: Health Research, Emerging Technologies and Marginalized Groups
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<b>Health &amp; Society</b>	HSOC 301: Determinants of Health
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<b>Medical Science</b>	MDSC/BIOL 515: Cellular Mechanisms of Disease MDSC 613.01: Advanced Studies in Microbiology
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<b>Medicine</b>	MDCN 340: Population Health
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## Faculty of Veterinary Medicine

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<b>Veterinary Medicine</b>	VETM 323: Animals, Health, and Society VETM 440: Public Health and Risk Analysis VETM 451: Selected Topics in Areas of Emphasis II VETM 507: Professional Skills III VETM 561: Ecosystem and Public Health Field Course VETM 583: Ecosystem and Public Health
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## Faculty of Nursing

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<b>Nursing</b>	NURS 288: Supporting Health I: Communities and Populations NURS 401: Community Health Theory
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## Faculty of Social Work

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<b>Social Work</b>	SOWK 300: Generalist Practice in Context Theme Course SOWK 302: Research in Context Theme Course SOWK 304: Diversity and Oppression Theme Course SOWK 363: Human Development and Environments SOWK 383: Social Policy and Social Justice SOWK 397: Practice and Evaluation with Communities SOWK 632: Social Policy and Social Justice SOWK 665: Influencing Policy Development SOWK 669: Leading Organizations and Communities SOWK 671: Social Policy SOWK 673: International Social Development SOWK 697: Diversity, Oppression and Social Justice
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## Faculty of Kinesiology

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<b>Kinesiology</b>	KNES 339: Natural Environments, Wellness, and Health
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## University of Calgary Topics

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### Interdisciplinary Topics

UNIV 207: Exploring Sustainability  
UNIV 511.01: Topics in Sustainability - Introduction to Sustainable Development  
UNIV 511.02: Topics in Sustainability - Theoretical Basis for Interdisciplinary Intervention & Design  
UNIV 513: Introduction to Interdisciplinary Design Structure  
UNIV 515: Advanced interdisciplinary Design Practice  
UNIV 611.01: Topics in Sustainability - Introduction to Sustainable Development  
UNIV 611.02: Topics in Sustainability - Theoretical Basis for Interdisciplinary Intervention & Design  
UNIV 613: Introduction to Interdisciplinary Design Structure  
UNIV 615: Advanced Interdisciplinary Design Practice

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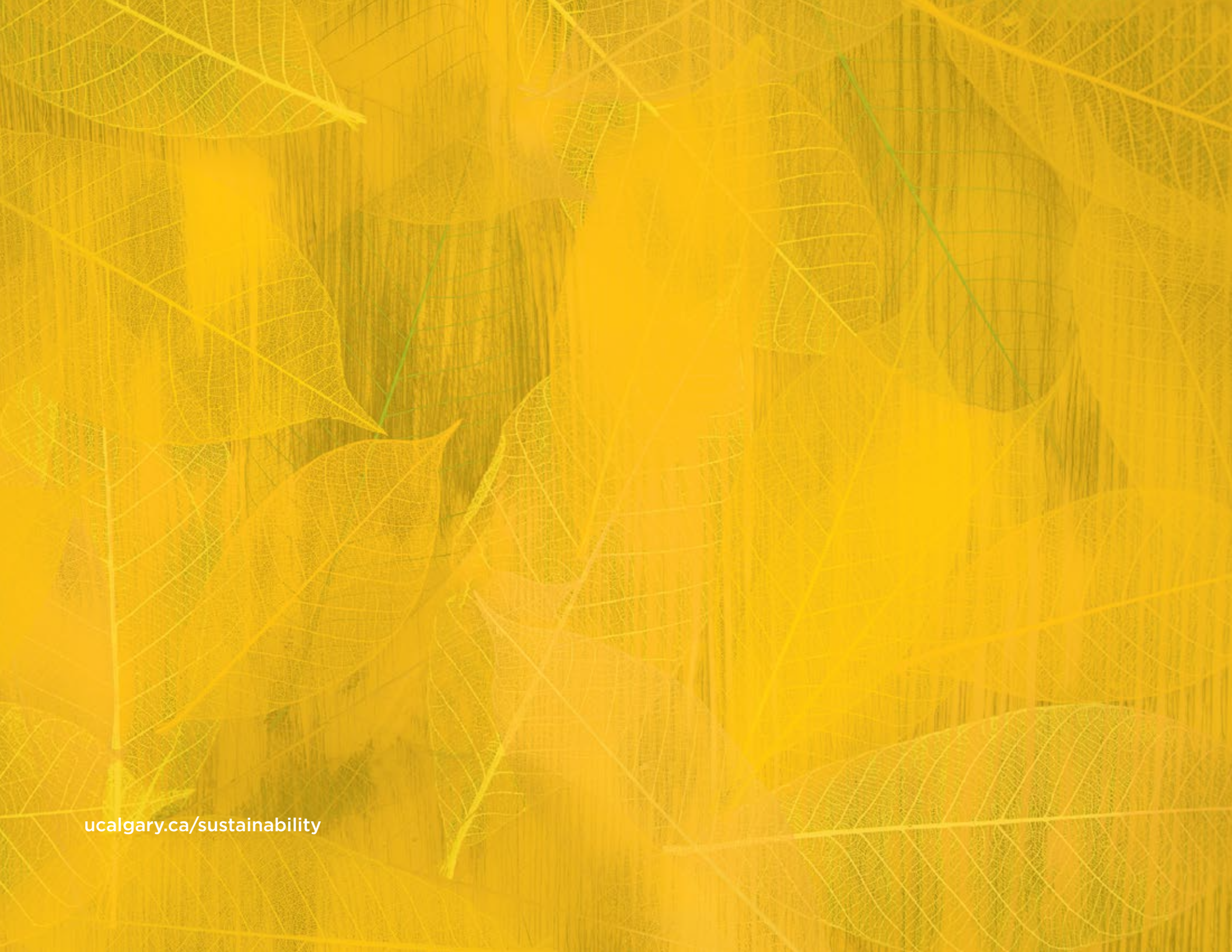
### Sustainable Energy Development (MSc)

SEDV 601: Energy Systems I: Non-Renewable Energy  
SEDV 603: Energy Systems II: Renewable Energy  
SEDV 605: Ecology, Sustainable Development, and Indigenous Cultures  
SEDV 607: Water Pollution and its Impact on the Energy Sector  
SEDV 609: Air Pollution and its Impact on the Energy Sector  
SEDV 611: Land Pollution and Waste Management in the Energy Sector  
SEDV 615: Environmental Impact Assessment in the Energy Sector  
SEDV 621: Environmental Management Tools in the Energy Sector  
SEDV 623: Strategic Environmental Planning for Energy Organizations  
SEDV 625: Research Project  
SEDV 627: Group Research Project  
SEDV 631: Life Cycle Assessment in the Energy Sector  
SEDV 699: Topics in Energy and the Environment

### Innovation

INNO 323: The Practice of Innovation

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[ucalgary.ca/sustainability](http://ucalgary.ca/sustainability)