

AC 1 Academic Courses Université Laval's Sustainability Curriculum: Offering and Inventory

Introduction

Over the past five years, Université Laval has undertaken a major project to recognize, valorize and promote sustainability curriculum in classrooms across every department and faculty. Stemming from the office of the Vice-Rectorate, an inter-faculty committee, the Advisory Committee on Sustainability Education, was created in 2012 to undertake this mandate.

Method

The committee identified five key competencies in sustainability (Wiek et al, 2011) which could be adapted to fit courses and programs across the campus. These are core competencies that students must develop to be adequately equipped to understand and address these issues. Therefore, even courses that do not relate directly to socio-environmental issues can contribute to our collective resolution ability by developing the skills necessary to cope with these crises.

Based on this framework, the committee devised a 15-minute questionnaire which allows professors to self-evaluate to what degree their course integrates these themes. This method produces a level of granularity previously unattainable in the university setting. Rather than simply a binary "Sustainability Course" demarcation, Laval's method places courses along a continuum to express not just which aspects of sustainability are addressed, but also the degree to which those key competencies are developed. Ultimately, Sustainability courses are designated as either "Awareness", "Introductory" or "Advanced" courses.

To be considered a "Sustainability Course," the course's curriculum must be identified by the teaching professor as significantly developing at least one of these competencies. If it does, the professor then identifies it as a "Awareness" course (creating an initial awareness of the issue), an "Introductory" course (sensitizing and providing a preliminary study) or a "Advanced" course (sensitizing, introducing and critically analysing the subject).



| Cou | ırco | Name | Description | # of | Level | Donartmont | Systoms | 4 Key Com Anticipatory | | Stratogic | Integration into |
|-----|------|--------------------------------|--|----------|---------------|---------------------------|---------------------|---------------------------|------|------------------|------------------|
| | | | · | Sections | | Department | Systems Thinking | | | , and the second | Sustainability |
| | 1905 | Éducation milieu interculturel | Birli history of Intercultural education in Quebec. Overview of theories on entiric minorities: assimilation, integration, adaptation, social, ethnic and linguistic stratification. Impact on the school. Intercultural education experiences in other countries. Difficulties and dynamics related to multi-ethnic school situations. Intervention strategies. This course develops students' cultural openness with a sustainable development perspective. | 3 | Undergraduate | Administration scolaire | 2, 2, 2 | 2, 0, 0, 2 | 1, 2 | 2, 1, 0 | Awareness |
| AGC | 1001 | Microéconomie appliquée | The aim of this course is to introduce the student to the economic analysis of the problems of agriculture. The main concepts of microeconomics are introduced and discussed in an applied framework based on examples and interpretations of concepts | 1 | Undergraduate | Agroéconomie | 2, 3, 3 | 2, 0, 2, 2 | 0, 1 | 2, 1, 1 | Awareness |
| AGC | 2001 | Écon. ress. natur. & environn. | irelated to armoconomics. Economic analysis of problems related to the use of renewable resources in agricultural, agri-food, forestry and fisheries activities. Use of economic instruments to assess the impact of these activities on degradation of resources and the environment. Economic fundamentals of resource conservation and environmental policies. | 1 | Undergraduate | Agroéconomie | 2, 2, 2 | 3, 2, 2, 1 | 2, 1 | 2, 2, 2 | Introductory |
| AGC | 4003 | Comm. agroalim., inst. intern. | Presentation of theories explaining the direction and volume of international trade in agricultural goods. Analysis of trade and agricultural policies and their effects on the welfare of populations. Analysis of regional and multilateral trade agreements. Case studies on specific interventions in the agri-food sector. | 1 | Undergraduate | Agroéconomie | 1, 1, 1 | 1, 0, 1, 1 | 2, 0 | 2, 2, 2 | Advanced |
| AGC | 7001 | Ruralité et sous-développement | Rural underdevelopment is a concern in both economically less developed and industrialized countries. This course, therefore, addresses the nature and dimensions of socio-economic underdevelopment of rural populations through various lenses and themes. | 1 | Graduate | Agroéconomie | 3, 3, 3 | 3, 2, 2, 3 | 2, 3 | 3, 3, 2 | Advanced |
| AGC | 7005 | Gest. dével. agricole et rural | Through examples and practice, this course analyses interventions in agricultural or rural development in both the Southern and Northern contexts, comparing and constrasting the particularities of each. | 1 | Graduate | Agroéconomie | 2, 3, 2 | 2, 1, 1, 2 | 1, 1 | 3, 1, 2 | Awareness |
| AGF | 6002 | Socioécculturel agroforest. | Familiarization with the main social, economic and cultural aspects linked to the dissemination and use of agroforestry | 1 | Graduate | Agroforesterie | 3, 2, 2 | 3, 2, 2, 2 | 1, 2 | 2, 3, 2 | Advanced |
| | | Agroforesterie tempérée | techniques. Multifunctionality of agriculture, and resources of the forest. Agroforestry systems in temperate environments: windbreak hedges, wooded riparlan strips, intercropping systems, sylvopastoral systems, crops under canopy, Non-limber forest products and systems related to agroforestry: food, medicinal and ornamental plants; Forest mixtoroms. Trees for the production of biomass. Agroforestry: soil fertility. Walter quality: mixrodimate: climatic changes; Biodiversity: economy; society: landscape: territory Development. Government and institutional policies; Regulatory aspects. Issues of agroforestry in Québec and development strategies. | 1 | Graduate | Agroforesterie | 2, 2, 1 | 2, 1, 2, 1 | 1, 1 | 1, 1, 2 | Awareness |
| AGN | 3101 | Gest. agroenvir. entreprises | Agricultural environment in Quebec, implementation of an agi- environmental fertilization plan, farm regulations, systems approaches and budgels, crop fertilization, crop utilization and rotation, nitrogen and mineral balance of livestock, treatment and processing of etiluents, management of Odors, agroenvironmental advice, agronomic practice, ethics. | 1 | Undergraduate | Agronomie | 2, 2, 2 | 3, 3, 1, 2 | 2, 2 | 3, 2, 2 | Advanced |
| AGN | 7900 | Comm. & innov. agric., rurale | The course covers the agronomic, environmental, economic and social aspects of tropical agriculture. | 1 | Graduate | Agronomie | 1, 1, 1 | 1, 0, 1, 1 | 1, 1 | 1, 1, 0 | Awareness |
| | 6007 | Parcs et réserves écologiques | This course addresses major current ecological issues related to resource conservation in protected natural areas, using historical perspectives and critical analysis. | 1 | Graduate | Aménagement du territoire | 3, 3, 3 | 3, 2, 2, 3 | 1, 3 | 3, 3, 1 | Advanced |
| AME | 6008 | Gest. environn. milieu rural | This course provides the environmental knowledge required for rural land-use planning processes. | 1 | Graduate | Aménagement du territoire | 3, 3, 2 | 3, 3, 2, 3 | 2, 2 | 3, 2, 3 | Advanced |
| AME | 6021 | Écologie et aménagement | In any land-use planning project, the manager must take into account the environmental aspects directly or indirectly related to | 1 | Graduate | Aménagement du territoire | 2, 2, 2 | 3, 3, 2, 2 | 1, 1 | 2, 1, 1 | Introductory |
| AME | 6025 | Planif. urbaine.: contraintes | the project. The objective of this course is to understand the intervention potential in the municipal environment, and to study the evolution of socio-economic interactions in the development of a territory. The course covers all the facets necessary to develop an urban environment. It is divided into four themes: knowledge of the territory (image of the city, analysis of the territory): Tax analysis: Site analysis: Seminar on important issues in urban development (urban transport, new technologies, urban wastelands). | 1 | Graduate | Aménagement du territoire | 2, 2, 2 | 3, 2, 1, 3 | 1, 2 | 2, 3, 3 | Awareness |
| AME | 6043 | Gest. écol. espèces envahiss. | This course deals with exotic species (plants, animals) of foreign origin that are invasive in their host country. The global situation of invasive organisms. Mechanisms of dispersal or spread of invasive organisms. Ecological and economic consequences of biological invasions. | 1 | Graduate | Aménagement du territoire | 2, 3, 2 | 2, 3, 0, 2 | 1, 2 | 3, 2, 3 | Advanced |
| AME | 6045 | Cadre inst. québ. aménagement | The aim of this course is to familiarize the student with the foundations of the spatial and urban planning system in Quebec. Emphasis is placed on the challenges of managing urbanization and integrated and sustainable resource development and, especially the role and scope of the various tools in planning, regulation and direct intervention in these areas. | 1 | Graduate | Aménagement du territoire | 2, 2, 1 | 2, 2, 2, 2 | 0, 2 | 1, 0, 1 | Introductory |
| AME | 6053 | Séminaire: eau et territoire | This course focuses on the integrated management of water resources from a spatial planning perspective. It covers such issues as the protection of surface water and groundwater, drinking water management, sustainable management of rainwater, the protection of shores, coastlines and flood plains, the impact of Climate change, development of least impact, green infrastructure, etc. | 1 | Graduate | Aménagement du territoire | 2, 3, 2 | 3, 2, 1, 2 | 2, 2 | 2, 2, 2 | Advanced |
| AME | 6057 | Stratégies d'intervention | This course examines the foundations of the main intervention strategies and practices in regional and local development. Phenomena such as territorial planning, entrepreneurship, innovation, territorial governance and sustainable development are studied from a theoretical and practical point of view, with attention paid to regional and local development, both in | 1 | Graduate | Aménagement du territoire | 2, 2, 2 | 0, 0, 1, 1 | 0, 1 | 1, 2, 2 | Awareness |
| AME | 6058 | Santé publiq, aménag, territ. | metronolitan and rural areas. The objective of this course is to improve the scope of spatial planning by integrating a public health perspective. The student has the opportunity to develop their knowledge of the main methods of analysis in public health and the main health indicators relevant to the planner. They are also introduced to methods of health impact assessment in development projects. | 1 | Graduate | Aménagement du territoire | 2, 2, 3 | 2, 3, 2, 2 | 2, 1 | 2, 3, 1 | Awareness |



| Cou | irse | Name | Description | # of | Level | Department | Systems | 4 Key Com Anticipatory | | Strategic | Integration into |
|------------|------|---|---|----------|-----------------------------|---------------------------|----------|---------------------------|------------------|-----------|---------------------------|
| | | | | Sections | | · | Thinking | | | | Sustainability |
| AME | 6059 | Mise en oeuvre / transp. dur. | This course examines methods for implementing sustainable modes of transportation. In this course, transportation is studied from a behavioral point of view. The student examines various solutions, including international examples. They are also familiarized with sustainability measures and new concepts related to sustainability. | 1 | Graduate | Aménagement du territoire | 2, 2, 2 | 2, 2, 2, 2 | 2,2 | 1, 1, 2 | Advanced |
| AME | 6060 | Dév. terr. : diagn. gouv. pr. | This course allows students to acquire theoretical and practical knowledge to intervene in the development of territories on various spatial scales, whether in urban or rural territories, metropolitan or non-metropolitan areas. The teaching focuses both on methods and instruments for the diagnosis of territories across various phases, and on an action-oriented approach. Furthermore, this course studies the processes of territorial governance by examining the devices and tools, and leads to practices oriented towards the sustainable development and resilience of territories. | 1 | Graduate | Aménagement du territoire | 2, 2, 2 | 1, 1, 1, 1 | 0, 1 | 1, 2, 2 | Awareness |
| AME | 6062 | Sécurité civile et amén. terr. | This course demonstrates how land use planning have a direct impact on the risks and the consequences of disasters. It deals in particular with the factors influencing the vulnerability of the environments, natural and anthropogenic hazards to which Coubec is exposed (landsidies, coastal erosion and flooding, floods, accidents involving hazardous materials, etc.), as well as measures in place to mitigate the associated risks. The close links between these issues, adaptation to climate change and sustainable development are also discussed. | 1 | Graduate | Aménagement du territoire | 2, 2, 1 | 3, 3, 1, 1 | 2,2 | 3, 3, 2 | Advanced |
| AME | 6063 | Villes en reconstruction | This course examines the processes of rebuilding a city after a natural, economic, political or technological disaster. The various types of proposals that planners, economists, sociologists and politicians contribute to design and improve the city following a major crisis. | 1 | Graduate | Aménagement du territoire | 2, 2, 2 | 3, 3, 2, 2 | 1, 2 | 3, 2, 2 | Advanced |
| AME | 6064 | Act., part. publ., amén. terr. | Focusing on the debates that have taken place throughout Quebec and elsewhere, this course puts into perspective the key tole of certain figures and actors (managers, promoters, social movements, etc.) in the transformation of concepts and approaches to spatial planning it addresses demands, controversies, conflict resolution systems, ethical issues and challenges of inlegating multiple positions in land planning, especially in the face of environmental and social challenges. | 1 | Graduate | Aménagement du territoire | 3, 3, 3 | 2, 1, 2, 2 | 2, 3 | 3, 3, 1 | Introductory |
| AME | 6601 | Essai-laboratoire amén., dév.1 | This course consists of a final writing activity for the master's student in the professional component of regional planning and development (ATDR). This course allows to study a concrete problem within the field, allowing the student to deal with a large number of methodological and technical aspects. | 1 | Graduate | Aménagement du territoire | 3, 3, 1 | 2, 1, 1, 2 | 2, 1 | 3, 3, 3 | Advanced |
| AME | 6602 | Essai-laboratoire amén., dév.2 | This course consists of a final writing activity for the master's student in the professional component of regional planning and development (ATDR). This course allows to study a concrete problem within the field, allowing the student to deal with a large number of methodological and technical aspects. | 1 | Graduate | Aménagement du territoire | 3, 3, 1 | 2, 1, 1, 2 | 2, 1 | 3, 3, 3 | Advanced |
| ANT | 1501 | Anthropologie des Amérindiens | A critical introduction to the social and cultural anthropology of First Nations populations, with particular emphasis on the Northeast region. The course includes a description of the traditional economic, social, political and ideological structures. | 1 | Undergraduate | Anthropologie | 3, 3, 3 | 1, 2, 3, 2 | 2, 3 | 2, 3, 2 | Advanced |
| ANT | 2307 | Dossiers autochton. contempor. | The aim of the course is to analyze the current topical issues relating to indigenous peoples. The emphasis is on indigenous political challenges, affirmation and reappropriation of territories, and the social and political issues facing communities. | 1 | Undergraduate | Anthropologie | 1, 1, 2 | 1, 1, 1, 1 | 1, 2 | 1, 1, 1 | Awareness |
| ARC | 1008 | Aspects humains | This course presents the concepts and methods useful for the study of the relationships between people and the environment, and the practice of populations ensitive architecture. It focuses on the understanding of fundamental concepts related to the perception of the environment, spatial behaviors, and life in society. | 1 | Undergraduate | Architecture | 1,1,1 | 1, 0, 0, 1 | 0, 0 | 1, 0, 1 | Awareness |
| ARC | 2001 | Architecture et environnement | This course introduces the basic notions of environmental science that can be used in architectural design. The effects of climate on the shape, orientation, plan and materials of the architectural project are studied. Design methods for taking account of wind, sunshine and snow, as well as the use of renewable energies (passive and active) are also discussed. | 1 | Undergraduate | Architecture | 3, 3, 3 | 3, 3, 3, 3 | 2,2 | 3, 1, 2 | Introductory |
| | | Design urbain: concepts, méth. | Approaches, concepts and methods for the design and control of the physical forms within a city, and for the qualitative development of living environments: urban morphology and history, new lown planning, viable communities, etc. Emphasis is placed on the organization of butil environments and the quality of urban environments. Case studies, practical applications, work with modeling software. This course allows students to integrate concepts related to quality of life, within the framework of urban clanation. | 1 | Graduate | Architecture | 3, 3, 3 | 3, 3, 2, 3 | 1, 2 | 2, 2, 2 | Advanced |
| | | Biologie générale | This course presents the basic principles of modern biology. It teaches theoretical concepts from practical examples drawn from the history of biology and the most recent discoveries. Sudients will gain an understanding of biology nuanced with a particular emphasis on the sustainable development aspects of the field. | 5 | Undergraduate | | 2, 1, 2 | 2, 0, 0, 0 | 0, 1 | 0, 0, 0 | Awareness |
| BIO BIO | | Les Animaux d'expérience Écologie et pollution | Introduction to the science of experimental animals. Moral and ethical considerations. Environmental problems and their solutions from the angle of the ecology and functions of the ecosystems. Sustainability of ecosystems and the notion of equilibrium. Human impacts air, water, soil and groundwater, solid waste. Global issues; greenhouse effect and climate change, alternative energies, acid rain, ozone layer, conservation of bodiversity, protected areas, international agreements. Environmental assessment, environmental management and certification. Sustainable devolutionment ontology. | 1 | Undergraduate Undergraduate | 9 | 2, 2, 3 | 3, 2, 1, 1 | 3, 3 3, 1 | 2, 2, 2 | Introductory Introductory |



| Соц | ırse | Name | Description | # of Sections | Level | Department | Systems Thinking | 4 Key Com Anticipatory | | Strategic | Integration into Sustainability |
|-----|------|--------------------------------|---|------------------|---------------|-------------------|---------------------|---------------------------|------|-----------|------------------------------------|
| BIO | 2202 | Mammalogie | Description of the distinctive characteristics of mammals. Origin, evolution and biogeography of the class. Classification of current mammals. Functional and ecological aspects of typically mammalian adaptations (occomotion, mastication, reproduction, lactation and social organization). Introduction to the literature of mammalogy. The origin and place of domestic mammals and our species among other mammals. Mammalian systematics based on observation, comparison and identification of skulls. Functional analysis of the mechanics of chewing carnivores and herbivores. Mechanical analysis of the locomotion of walking mammals, runners and swimmers. Observations and comparisons oriented towards the identification and functional understanding of bones of various mammals. | 1 | Undergraduate | Biologie | 2,1,1 | 2, 1, 1, 1 | 0,0 | 2, 1, 1 | Awareness |
| BIO | 2901 | Phytopathologie | Main abiotic (acid rain) and biotic diseases: symptomatology, etiology, pathogenesis, epidemiology. Main pathogens: fungi, bacteria, viruses, virotids and nematodes. Physiology of plant- pathogen interactions. Main control methods: chemical, genetic and biological. New developments in research. Students will gain an understanding of epidemiology nuanced with a particular emphasis on the sustainable development aspects of the field. | 1 | Undergraduate | Biologie | 2, 2, 2 | 2, 1, 1, 2 | 0, 2 | 2, 1, 2 | Introductory |
| BIO | 2903 | Lutte contre ennemi de plantes | The theory and principles of integrated control of arthropod pests, weeds and plant diseases are discussed in the current context of plant protection, espicially with the added challenges linked to climate change. Pesticide replacement solutions. Principles of control: cultural, biological and chemical control. Prevention and screening. Use and attributes or natural enemies of various pests. Preventive cultural methods. Intervention protocols. Issues in | 1 | Undergraduate | Biologie | 2, 2, 2 | 2, 2, 1, 2 | 1, 2 | 2, 1, 2 | Advanced |
| BIO | 3201 | Gestion et conservation faune | Principles for the Management of Wildilfe and its Habitats. Analysis of environmental factors influencing wildlife populations with particular attention to habitat quality and predation and nutrition of wildlife. Elements of conservation: protection of the territory, genetic variability and methods of population control. | 1 | Undergraduate | Biologie | 2, 2, 1 | 1, 1, 1, 1 | 2, 0 | 2, 2, 2 | Advanced |
| BIO | 4100 | Génét., conserv. biodiversité | This course aims to demonstrate the value of using synergistic knowledge of molecular biology and population genetics in order to answer questions relating to the applied nature of ecology and conservation biology. | 1 | Undergraduate | Biologie | 2, 2, 1 | 1, 0, 0, 0 | 1, 0 | 2, 0, 0 | Awareness |
| BIO | 4900 | Écologie et environnement | Relations between organisms, their habitats and human activity in a context of sustainable development and global change: The foundations and function of marine and terrestrial ecosystems, ecosystem services, biolic integrity and the concept of stability: Biogeography and biological invasions: Environmental crisis; Ecotoxicology, Management of living resources. | 1 | Undergraduate | Biologie | 3, 3, 3 | 3, 3, 2, 3 | 1, 2 | 2, 2, 2 | Advanced |
| BIO | 4901 | Évolution et biodiversité | This course is an invitation to discover evolutionary biology. The course begins with an in-depth study of the modern classification of the living world with several examples that highlight the economic value of biodiversity, Many limks are made between biodiversity and the concepts of sustainable development. | 1 | Undergraduate | Biologie | 2, 2, 2 | 1, 1, 1, 2 | 1, 2 | 2, 0, 0 | Awareness |
| BIO | 6901 | Écologie, environn.: actualité | Relations between organisms, their habitats, and human activity in a context of sustainable development and global change: The foundations and function of marine and terrestrial ecosystems, ecosystem services, biolic integrity and the concept of stability. Biogeography and biological invasions: Environmental crisis; Ecotoxicology, Management of living resources. Students who have passed the undergraduate course BIO-4900 Ecology and Environment does not have to take this course. | 1 | Graduate | Biologie | 3, 3, 3 | 3, 2, 2, 3 | 1, 2 | 3, 1, 1 | Advanced |
| BVG | 7044 | Réactions défense des plantes | The objective of this course is to study each mechanism related to the resistance of a plant to attack by a pathogen and to identify the sequence of events occurring during these reactions. Students will gain an understanding of plant biology nuanced with a particular emphasis on the sustainable development aspects of | 1 | Graduate | Biologie végétale | 1, 2, 1 | 0, 2, 1, 1 | 0, 0 | 1, 0, 0 | Awareness |
| СНМ | 1005 | Chimie des élém. groupes s, p | the field. The elements of the families s and p of the periodic table and their compounds are studied in depth, emphasizing the peculiarities and the evolution of the properties of each family. Topics include natural state, physical properties, chemical reactions, modes of production, industrial applications and recovery. Sudents will gain an understanding of chemistry nuanced with a particular emphasis on the sustainable detendenment aspects of the filled. | 1 | Undergraduate | Chimie | 1, 1, 1 | 1, 1, 1, 1 | 0,0 | 2, 1, 0 | Awareness |
| СНМ | 2000 | Chimie organique II | Reactions of carbonyl compounds. Syntheses and Reactivity of Carbonylic Acid Derivatives. Preparation of enolates and formation of carbon-carbon bonds: alkylation, conjugated addition, aldotization, acylation and other similar reactions. Aromaticity and reactivity of aromatic systems electrophilic and nucleophilic substitution. Elements of organic synthesis. Students will gain an understanding of chemistry nunced with a particular emphasis on the sustainable development aspects of the field. | 1 | Undergraduate | Chimie | 1, 0, 0 | 1, 1, 0, 0 | 0, 1 | 1, 0, 0 | Awareness |
| CHM | 4300 | Chimie industrielle | This course reviews the main aspects of industrial chemistry. It presents the current chemical knowledge concerning the production of the main mineral, metallurgical, organic and polymeric products. The course also covers the following subjects: raw materials, industrial research and development and optimization of reactions: The most important global chemical industries, energy, chemical risk, environmental impacts and cleanup, quality control and economics of chemistry and industrial property. | 1 | Undergraduate | Chimie | 2, 2, 1 | 3, 3, 2, 2 | 1,1 | 2, 2, 2 | Introductory |
| CNS | 1006 | Consumérisme, persp. consomm. | Analysis of the evolution of the consumer society, consumerism and the anticonsumeration movement: Exploring the fundamental rights and social responsibilities of consumers and businesses: Study of the relationship between consumer ethics and business ethics: An overview of the professional roles of specialists in consumer science. | 1 | Undergraduate | Consommation | 2, 2, 2 | 2, 1, 1, 1 | 1, 2 | 2, 1, 0 | Awareness |
| COM | 2300 | Introd. relations publiques | introduction to the basic knowledge required to carry out communication strategies; knowledge of the organization, the environment, the psychology of the individual, the public opinion, the media and communication techniques. The research tools pertaining to each of these topics. Students will gain an understanding of communication and public education, nuanced with a particular emphasis on the sustainable development seconts of the file! | 2 | Undergraduate | Communication | 2, 2, 2 | 3, 2, 1, 1 | 2, 2 | 2, 3, 3 | Awareness |
| COM | 2301 | Démarche et moyens de relation | securic or the nature Presentation of the strategies and the main tools, supports and communication techniques used in public relations. Students will gain an understanding of communication and public education, nuanced with a particular emphasis on the sustainable development aspects of the field | 2 | Undergraduate | Communication | 1,1,1 | 1, 1, 0, 1 | 0, 1 | 1, 1, 1 | Introductory |



| Соц | ırse | Name | Description | # of Sections | Level | Department | Systems Thinking | 4 Key Con Anticipatory | npetencies Normative | Strategic | Integration into Sustainability |
|-----|------|--------------------------------|---|------------------|---------------|-----------------------|---------------------|---------------------------|-------------------------|-----------|------------------------------------|
| СОМ | 4150 | Comm. intercultur. internat. | Initiate communication between people from different cultures. Develop awareness, sensitivity, ways of thinking and skills. Two Intercultural training approaches used: general (prepares for interactions in any culture) and specific (informs about a specific culture). This course develops a student's cultural openness, as well as the sustainable development aspects of communication and public education. | 1 | Undergraduate | Communication | 1,1,3 | 2, 2, 1, 1 | 1, 2 | 1, 1, 0 | Awareness |
| СТВ | 1903 | Mes finances personnelles | Students assess their current financial situation and to set themselves certain objectives, in particular in terms of repayment of debts and savings. To this end, they acquires basic personal financial planning. The student uses the acquired knowledge to improve their quality of life. | 1 | Undergraduate | Comptabilité | 2, 1, 2 | 2, 2, 1, 0 | 2, 2 | 0, 1, 1 | Introductory |
| СТВ | 3112 | Comptabilité dével. durable | This course introduces the student to sustainable development issues and their impact on accounting, and the role of the accountant in organizations. The student is led to better understand the challenges of sustainable development. They also study the effects of including sustainable development issues in an organization's strategy, concepts related to environmental cost management and ecodesign and measurement of environmental assessment. Financial and non-financial performance in the context of sustainable development. | 4 | Undergraduate | Comptabilité | 2, 2, 2 | 3, 2, 3, 3 | 1, 2 | 2, 2, 3 | Advanced |
| CTB | 6099 | Écocontrôle, gest. coûts env. | This course is intended for students who have not taken an accounting course in North America beforehand, and who wish to understand the importance of financial tools to analyze the profitability of sustainable development issues and their management. It raises the student's awareness of the accounting and financial aspects of sustainable development, including managing environmental costs, measuring sustainable performance, ecological monitoring, analyzing investment projects and disclosing environmental and social security. | 1 | Graduate | Comptabilité | 3, 3, 3 | 2, 2, 1, 2 | 1, 1 | 3, 3, 3 | Advanced |
| | | Expertise compt., dével. dur. | This course introduces the student to sustainable development issues and their impact on accounting and the role of the accountant in the organization. The student will be better able to understand these issues and to control the effects of their inclusion in the strategy of an organization, as well as concepts relating to the management of environmental costs, ecological control and the measurement of the environment. Assessment of financial and non-financial performance in the context of sustainable development. | 1 | Graduate | Comptabilité | 2, 2, 3 | 2, 2, 2, 3 | 1, 3 | 2, 1, 3 | Advanced |
| DDU | 1000 | Fondements du dével. durable | This introductory course on sustainable development is for all undergraduate students. It provides an introduction to the concept, its dimensions, and tools for implementing sustainable development. | 3 | Undergraduate | Développement durable | 3, 2, 3 | 3, 2, 2, 2 | 1, 3 | 1, 1, 1 | Introductory |
| DDU | 1200 | Patrimoine, développ. durable | Deceasorman. This course studies heritage as a tool for sustainable development. Heritage, through the conservation and transmission of precious material and immaterial goods, mobilizes communities towards the realization of a common project. It allows them to develop a sense of belonging and to project themselves into the future. | 1 | Undergraduate | Développement durable | 3, 3, 3 | 3, 3, 3, 3 | 3, 3 | 3, 3, 3 | Introductory |
| DDU | 1300 | Mes habitudes de vie, ma santé | The student distinguishes the favorable and unfavorable elements of their lifestyle and identifies strategies to improve them. The student is called to make connections between their lifestyle and their impact on their health and his environment and vice versa. They develop their skills in introspection, and determines strategies to improve their usualty of life | 1 | Undergraduate | Développement durable | 1, 0, 1 | 2, 2, 0, 1 | 0, 1 | 1, 0, 0 | Awareness |
| DDU | 1301 | Mon équilibre alimentaire | Stratenes in unmonite intermination that it has displayed in the student studies the fundamentals of healthy ealing and the impact on their quality of life. Integration of notions of sustainable development into ealing habits. At the end of the process, the student will be able to target the strengths and weaknesses of their diet and put into action certain strategies to optimize it. | 3 | Undergraduate | Développement durable | 3, 1, 1 | 3, 3, 1, 1 | 0, 2 | 1, 0, 2 | Awareness |
| DDU | 1302 | Mon mode de vie actif | The student learns the notions about various determinants of physical filtness. The student determines the needs, abilities, motivational factors and constraints that will allow them to make relevant choices of physical activities that have a positive impact on their unaity of life. | 3 | Undergraduate | Développement durable | 1, 0, 0 | 1, 3, 0, 3 | 0, 1 | 1, 0, 3 | Introductory |
| DDU | 1303 | Mon stress sans détresse | The student determines their stress indicators and measures the impacts on their quality of life. They acquires theoretical knowledge about the possible causes of stress in relation to their | 3 | Undergraduate | Développement durable | 2, 1, 1 | 2, 2, 2, 2 | 1, 2 | 2, 0, 1 | Awareness |
| DDU | 2000 | Aménagement durable du territ. | mode, environment and standard of livino. The course aims to introduce the student to the problems and ways of organizing spatial planning, particularly in the context of Quebec and in a perspective of sustainable development. It seeks to help the student understand why and how a society plans and controls the occupation, use and transformation of a tentinov. | 3 | Undergraduate | Développement durable | 2, 2, 2 | 2, 1, 1, 1 | 3, 2 | 2, 2, 1 | Sensiblisation |
| DDU | 2100 | Réflex. enjeux dével. durable | This course aims to enable the student to deepen their knowledge and mastery of the current challenges of sustainable development in Ouebecok, Canadian and international contests. By studying major environmental, social and economic phenomena, the student is led to perceive sustainable development as one of the essential social constructs of the 21st century. | 3 | Undergraduate | Développement durable | 3, 3, 3 | 2, 3, 3, 2 | 2, 3 | 3, 3, 2 | Advanced |
| DID | 7029 | Éd. env. dév. dur., péd. crit. | Purposes, principles and practical examples of environmental education and education for sustainable development. Application of principles of critical pedagogy in these fields. Project analysis | 1 | Graduate | Didactique | 2, 2, 1 | 2, 2, 1, 1 | 2, 2 | 2, 2, 2 | Introductory |
| DRT | 1721 | Intr. droit env., dév. durable | and case studies. Introduction to environmental law in the context of current and future environmental challenges. Presentation of the main legal instruments applicable in Quebec and in Canada to combat environmental pollution and climate change, preserve biodiversity and implement sustainable development. | 2 | Undergraduate | Droit | 1, 1, 0 | 1, 1, 0, 1 | 2, 2 | 1, 1, 0 | Introductory |
| DRT | 1901 | Introduction générale au droit | This course can not be followed by students enrolled in the Bachelor of Law. The objective of this course is to enable students who do not seek a specialization in law to familiarize themselves with the history, legal concepts and techniques of Quebec and Canadian law. Amongst others, this course introduces and discusse the environmental rights law, as well as the Law not Sixtainable Development | 3 | Undergraduate | Droit | 3, 3, 2 | 3, 3, 3, 3 | 3, 3 | 3, 3, 3 | Advanced |
| DRT | 2551 | Droit de l'environnement | Introduction to the Fundamental Principles of Environmental Law. Introduction to international environmental law. Sharing of legislative powers in relation to the environment and the right to | 1 | Undergraduate | Droit | 2, 2, 2 | 2, 2, 2, 1 | 2, 2 | 3, 3, 2 | Awareness |
| DRT | 2900 | Droit urbanisme, amén. territ. | the environment. Planning and planning powers, the historical role of local and regional municipalities: the Act respecting land use planning and development, the powers of local and regional municipalities, the control of land use, Zoning, the Environmental Quality Act, the Wastewater Disposal Regulations, flood zones, historic and archaeological istes, the effects of the Act regarding the housing board on subdivisions, airport areas. | 1 | Undergraduate | Droit | 2, 2, 2 | 2, 2, 2, 1 | 2, 2 | 3, 3, 2 | Awareness |



| Cou | ırse | Name | Description | # of Sections | Level | Department | Systems Thinking | 4 Key Com Anticipatory | | Strategic | Integration into Sustainability |
|-----|------|--------------------------------|--|------------------|---------------|-------------------------|---------------------|---------------------------|------|-----------|------------------------------------|
| DRT | 2905 | Législation forest., éthique | General introduction to Quebec and Canadian taw and legal systems. Study of the legislative corpus in which forestry is practiced in Quebec. Familiarzation with laws and regulations relating to the environment, corporate affairs, land use planning and forest management. | 1 | Undergraduate | Droit | 2, 2, 3 | 1, 0, 0, 1 | 3, 3 | 1, 2, 1 | Awareness |
| DRT | 3902 | Droit de l'arpentage | Surveys Act, Land Surveyvs Act and Regulations, certificate of location, picketing, federal and provincial government surveys, surveys under the Mining Act, technical descriptions, cadastral and land descriptions, descriptions of municipal territories and for administrative purposes. This course integrates knowlede of environmental regulation, and zoning laws (including land use conflicts) from a sustainable development perspective. | 1 | Undergraduate | Droit | 2, 2, 2 | 1, 1, 2, 1 | 2, 2 | 2, 2, 2 | Awareness |
| DRT | 6078 | Essai | The thesis is a written work of about fifty pages devoted to a doctrinal study, writing, analyzing, critiquing or solving a complex problem. This course allows the integration of normative competencies from a susalnable development perspective. | 3 | Graduate | Droit | 2, 2, 1 | 2, 2, 2, 1 | 2, 1 | 2, 2, 1 | Advanced |
| ECN | 1000 | Principes de microéconomie | Rarity, choice and cost of option. What to produce, how to produce it and for whom to produce it. Factors that determine the demand and supply function for a product. Pice and amount of balance. The laws of supply and demand. Concept of elasticity. Government intervention. Consumer choices: budget preferences and constraints. Business choices: profills and production function. Cost functions. Prices in competitive markets and monopolisits markets. This course introduces the sustainable development perspective in the study of economics. | 6 | Undergraduate | Économique | 1, 1, 1 | 1, 1, 1, 1 | 0, 1 | 1, 1,1 | Awareness |
| ECN | 1110 | Économie du développement | Introductory course on development economics. Among the topics discussed are poverty, resource inequality, the rural economy, the functioning of markets in this sector (notably the credit market), the role of economic growth, international trade and institutions. Reflection on the mechanisms underlying development problems. | 1 | Undergraduate | Economique | 2, 2, 2 | 1, 1, 1, 1 | 0, 0 | 1, 1, 0 | Awareness |
| ECN | 1120 | Économie du Québec | This course is analytical and applies economic science to questions regarding Quebec's economy, regional adjustment and geotechnical development factors, comparative advantage, industrial structure, resource rent, factor mobility and unemployment, linguistic attributes, government policies, Nationalism and federalism. This course introduces the sustainable development perspective in the study of economics. | 3 | Undergraduate | Economique | 2, 3, 0 | 3, 3, 3, 0 | 0, 3 | 3, 3, 0 | Advanced |
| ECN | 1140 | Energie, probl. écon. intern. | Analysis of the evolution of the international oil market. Behavior and strategy of the main players that dominate this market: OPEC, the United States, multinationals. Review of national energy policies. Study of the consequences of oil shocks on the international economic and political environment: the North-South dialogue, the petro-dollars, the indebtedness of the developing countries, etc. This course introduces he sustainable development perspective in the study of economics and energy | 1 | Undergraduate | Économique | 2, 2, 2 | 3, 2, 3, 3 | 1, 1 | 1, 3, 2 | Introductory |
| ECN | 1150 | Économie de l'environnement | Economic analysis, theoretical and practical aspects of environmental problems and their possible solutions: Pollution control policies (taxation of pollutant emissions, negotiable pollution duties, current regulations, etc.): Economists' proposals for monetary valuation of the benefits and costs of protecting the environment: Problems, such as the greenhouse effect. | 1 | Undergraduate | Économique | 2, 1, 1 | 1, 1, 1, 1 | 2, 1 | 1, 2, 2 | Introductory |
| ECN | 6951 | Dév. durable, ress., environn. | This course is a systematic overview of the problem of sustainable development in a world where the use of exhaustible resources is needed, especially environmental resources. The analysis of this problem is carried out according to two inseparable paths, one characterized as positive and the other as normative, in that it proposes interventions of a politico-economic nature. | 1 | Graduate | Économique | 3, 3, 3 | 3, 3, 3, 3 | 2, 3 | 3, 3, 3 | Advanced |
| EDC | 7011 | Réussir études universitaires | This course aims to train the student in the information retrieval process to quickly find relevant data in library and on the web, evaluate them and correctly cite the source. It also aims to get the student to use the results of this research effectively by presenting them using word processing software, a spreadshed program and Digital sideshow, while respecting generally accepted rules of presentation of information in writing and on screen. This course develops critical thinking from a sustainable development perspective. | 2 | Graduate | Éducation | 0, 0, 1 | 0, 0, 0, 0 | 0, 1 | 0, 0, 0 | Awareness |
| ENS | 1000 | Sciences et société | This course addresses several themes at the heart of some of the problems of today's world and situates them in a historical context. Topics are based on society's expectations of science and technology, and show how it has emerged in all spheres of society. It also addresses issues related to the stability of ecosystems, the nature and effects of various chemical contaminants in the environment, and the effects and consequences of electromagnetic or corpuscular radiation in natural environments. | 1 | Undergraduate | Enseignement secondaire | 2, 2, 2 | 2, 1, 1, 1 | 1, 1 | 1, 2, 1 | Awareness |
| ENV | 1010 | Fondements conservation envir. | In this course, students study the foundations of nature conservation as well as its applications in a constantly evolving socio-economic and political context. Nature conservation aims to protect biological diversity and to ensure that the use of ecosystems maintains or restores the desired characteristics of ecosystems and ensures their sustainable use. | 1 | Undergraduate | Environnement | 3, 3, 3 | 3, 1, 1, 3 | 1, 3 | 3, 3, 2 | Advanced |
| ENV | 1015 | Champs profess. conservation | This course is at the beginning of the program in order to allow the student to familiarize himself / hesself with all professional career opportunities and to make informed choices as he / she moves through the integrated baccalaureate program in natural and managed environments. This course presents the representative picture of the careers and challenges that await the graduate in the world of work in conservation. It should also enable them to better understand the interactions and the relative importance of the content of the courses offered in the program. In particular, it serves to better understand, through real experiences, the dynamics of work, by establishing the balance of power between the economic, social and environmental issues associated with conservation. | 1 | Undergraduate | Environnement | 2, 1, 1 | 1, 2, 1, 0 | 1,1 | 1, 1, 1 | Introductory |
| ENV | 2900 | Compost, util. agricult. biol. | This course addresses the principles of composting in organic agriculture and the beneficial effects of compost on the health of the agroecosystem. | 1 | Undergraduate | Environnement | 1, 2, 1 | 3, 3, 2, 2 | 1, 2 | 3, 2, 1 | Awareness |



| Cou | irse | Name | Description | # of | Level | Department | Systems | 4 Key Com Anticipatory | | Strategic | Integration into |
|-----|------|--------------------------------|--|------------|---------------|-------------------------------|---------|---------------------------|------|-----------|----------------------------|
| ENV | 3010 | Projet conservation environn. | Based on a case study, students, as part of a team, develop and present strategies and practices to identify the conservation, management and an ecosystem-based management perspective. They interact with the various stakeholders involved in the case to find solutions that can be the subject of social consensus, and to resolve conflicts in conservation. The curse uses a mentoring approach with specialists in the field. | Sections 1 | Undergraduate | Environnement | 3, 3, 3 | 3, 3, 3, 3 | 3, 3 | 3, 3, 3 | Sustainability Advanced |
| ENV | 6901 | Méth. gest. int. ress., espace | This integrated multidisciplinary course aims to give students basic training in integrated resource and space management so that they can interven in solving various environmental problems. Multiple concepts are discussed: sustainable development, biodiversity, conservation, management approaches, temporal and spatial scales of management, multi-rited-a aproach. | 1 | Graduate | Environnement | 3, 3, 3 | 3, 3, 3, 2 | 3, 3 | 3, 3, 2 | Advanced |
| ENV | 6902 | Prat. gest. int. ress., espace | This integrated multidisciplinary course aims to give students practical training in integrated resource and space management. The student must choose and carry out a practical experiment in the field. Three or four cases of study are possible. The proposed case studies are varied finitegrated management of the Nordic environment, integrated management of recreational tourism landscapes or integrated management of natural resources and impacts on the biosphere and territory). | 1 | Graduate | Environnement | 3, 3, 3 | 3, 3, 3, 3 | 3, 3 | 3, 3, 2 | Advanced |
| ENV | 7900 | Toxicol. agroenvironnementale | Introduction to toxicology and agrotoxicology. Cycles of chemicals in the agricultural environment. Effects of major classes of organic and inorganic contaminants that may affect agroecosystems. | 1 | Graduate | Environnement | 2, 3, 2 | 3, 3, 2, 2 | 2, 2 | 3, 2, 1 | Introductory |
| EPS | 1300 | Relaxation, autogestion stress | This course aims to transmit knowledge about the mechanisms of stress and the solutions to it. It also offers the opportunity to develop skills related to the practice of relaxation in relation to the requirements of personal and professional life. This allows students to acquire healthlier bablis, with an emphasis on the sustainable development aspect of such lifestyle changes. | 2 | Undergraduate | Education physique | 3, 3, 2 | 3, 3, 1, 2 | 0, 3 | 3, 0, 3 | Advanced |
| ERG | 2001 | Env.: poss., limites milieux | Application of intervention skills in in various personal environments to maximize living conditions. This course teaches practices for the management of quality of life from a sustainable development perspective. | 1 | Undergraduate | Ergothérapie | 1, 2, 1 | 1, 1, 1, 1 | 1, 1 | 2, 2, 2 | Awareness |
| ESP | 2000 | Culture espagnole | Presentation of the peaks of Spanish Peninsular culture. This course aims to familiarize the student with historical, political, economic, social and cultural data. Particular attention will be paid to the relationship between at and literature and society. As such, this course develops cultural openness and an understanding of Spanish culture from a sustainable development | 1 | Undergraduate | Espagnol | 3, 3, 3 | 3, 2, 2, 3 | 3, 3 | 3, 3, 1 | Awareness |
| ESP | 2003 | Culture de l'Amérique latine | nersnachus Presentation of the main phenomena of contemporary Latin- American culture. This course aims to familiarize the student with historical, political, economic, social and cultural data. As such, this course develops cultural openness and an understanding of Spanish culture from a sustainable development perspective. | 1 | Undergraduate | Espagnol | 1, 2, 1 | 1, 1, 1, 1 | 1, 1 | 2, 2, 2 | Introductory |
| ESP | 2005 | Literat. hispanoameric. actual | Study of the fundamental currents of Hispano-American literature from the 20th century until today. Analysis of some representative works. As such, this course develops cultural openness and an understanding of Spanish culture from a sustainable development perspective. | 1 | Undergraduate | Espagnol | 1, 1, 1 | 1, 1, 1, 1 | 1, 1 | 2, 2, 2 | Introductory |
| ESP | 2006 | Literatura española siglo XX | Study of the main currents, avant-gardes and representative authors of Spanish literature from the 20th century to the present day. As such, this course develops cultural openness and an understanding of Spanish culture from a sustainable development | 1 | Undergraduate | Espagnol | 3, 3, 3 | 3, 2, 3, 2 | 3, 3 | 2, 3, 2 | Awareness |
| ESP | 2007 | Literat. esp. del med. real. | nerspactive Periods and fundamental currents of Spanish literature, from its origins to the nineteenth century. Studies of important works of each epoch. As such, this course develops cultural openness and an understanding of Spanish culture from a sustainable development perspective. | 1 | Undergraduate | Espagnol | 1, 1, 1 | 1, 1, 1, 1 | 1, 1 | 2, 2, 2 | Introductory |
| ESP | 2204 | Cine y literaturas hispánicas | Course offered in Spanish. Presentation of cinematographic versions of Hispanic Ilterary texts. This course aims to familiarize the student with the historical, ideological, social and cultural data of the cinema in his relation to the Ilterature. As such, this course develops cultural openness and an understanding of Spanish culture from a sustainable development perspective. | 1 | Undergraduate | Espagnol | 1, 1, 1 | 1, 1, 1, 1 | 1, 1 | 2, 2, 2 | Introductory |
| ESP | 2212 | Temas literaturas hispánicas | Course offered in Spanish. A monographic course with a variable content that can be devoted to the study of a period, an artistic movement, an author or a subject in Spanish literature. As such, this course develops cultural openness and an understanding of Spanish culture from a sustainable development perspective. | 1 | Undergraduate | Espagnol | 3, 3, 3 | 3, 2, 3, 2 | 3, 3 | 3, 3, 1 | Awareness |
| FIS | 4103 | Coll. interprof. personne 3 | This inter-faculty course addresses interprofessional collaboration, which in the health system takes different forms depending on the contexts of practice. Collaboration is conditioned by a variety of factors discussed in this course. An understanding of current interprofessional practices coupled with a critical look at them facilities the learning of Interprofessional collaboration. Futhermore, this course develops students' team building skills, as well as interdisciplinary collaborating from a sustainable development perspective. | 3 | Undergraduate | Formation interdisc. En santé | 3, 3, 3 | 3, 2, 1, 3 | 3, 3 | 3, 3, 3 | Advanced |
| FOR | 1003 | Écologie forestière I | The role of forests in the biosphere. Analytical study of the forest: the physicochemical and biotic components. Biological processes: dispersal, regeneration, growth, competition, adaptation, mortality. Strategy for the formation of a forest community. Characteristics of plant groups. Motels of forest dynamics: evolution of the niche, population variability, | 1 | Undergraduate | Foresterie | 2, 1, 0 | 1, 0, 0, 0 | 0, 0 | 1, 0, 0 | Awareness |
| FOR | 1005 | Sols forestlers | succession. Geology, relief, surface deposits and hydrography. Original Materials, Pedogenetic Processes and Soil Classification (Canadian and American System). Soil organisms and forms of humus. Texture, structure, porosity and buik density. Ionic exchange and soil reactions (Ph), Water, almosphere and soil temperature. Forest Elements Cycle and Nutrition. Pedology and forest management. This course studies the adorementlined material with an academic emphasis placed on the sustainable | 1 | Undergraduate | Foresterie | 1, 1, 0 | 1, 1, 0, 0 | 0, 0 | 0, 0, 0 | Awareness |
| FOR | 1010 | Fondements de la foresterie | daulonoment necronorities. This course introduces the basic principles of forest science. A component is devoted to the definition of forestry in a global context. It describes the major stages in forest history, the contribution of forests to major global cycles, the evolution of the concept of sustainable forest management and the foundations of the current Courber forest system. | 1 | Undergraduate | Foresterie | 3, 3, 3 | 3, 2, 3, 3 | 1, 1 | 2, 2, 1 | Introductory |



| | | | Te | | | In | | 4 Key Com | | | |
|-----|------|--------------------------------|--|------------------|---------------|------------|---------------------|--------------|-----------|-----------|------------------------------------|
| Cor | ırse | Name | Description | # of Sections | Level | Department | Systems Thinking | Anticipatory | Normative | Strategic | Integration into Sustainability |
| | | Aménag. durable, intégr. forêt | This course aims to develop the student's skills associated with the implementation of sustainable and integrated forest management. The main objective is to acquire the conceptual and methodological bases necessary to develop sustainable management strategies for a given forest area. | 1 | Undergraduate | | 3, 3, 3 | 3, 3, 2, 3 | 3, 3 | 3, 2, 3 | Advanced |
| FOR | 1120 | Aménagem. récréatif & paysager | This course is intended to familiarize students with certain principles that form the basis of recreational, forest, and park management: national and provincial park policy, recreational potential analysis, development of recreational tourism product and militigation of the impacts of recreation. This course will also cover some approaches to the visual design of forest landscapes: inventory of the sensitivity of landscapes and miligation of the aesthetic impacts of logging. This course develops competencies in social acceptability, and studies the many possible uses of a given territory from a sustainable development perspective. | 1 | Undergraduate | Foresterie | 2, 2, 3 | 2, 3, 3, 2 | 2,3 | 3, 2, 3 | Advanced |
| FOR | 1201 | Géographie forestière | Origin and evolution of the world's forests: paleobotary, continental drift, prehistory and recent history. Climatic, edaphic and floristic factors responsible for the establishment of forests. The role of man in the transformation of forests. Synthesis on global deforestation and the future of forests. | 1 | Undergraduate | Foresterie | 3, 3, 3 | 2, 2, 1, 3 | 1, 2 | 2, 2, 1 | Advanced |
| FOR | 1202 | Sém. foresterie internationale | Practical study of selected themes in international forestry. Each topic includes an in-depth literature review and presentation given by a field consultant, followed by a discussion and synthesis report prepared by each student. This course develops the student's knowledge in forestry from a sustainable development perspective. | 1 | Undergraduate | Foresterie | 2, 1, 1 | 2, 1, 1, 0 | 0, 2 | 1, 1, 0 | Awareness |
| FOR | 2007 | Form. prat. sylvicult. écolog. | This practical training course focuses on the design of silvicultural intervention plans using an ecological approach that takes into account the dynamics, productivity, fragility and vulnerability of ecosystems. | 1 | Undergraduate | Foresterie | 2, 3, 2 | 3, 3, 0, 3 | 1, 1 | 3, 2, 3 | Advanced |
| FOR | 2009 | Form. prat. planif. sylvicole | This course is a follow-up to practical training in silviculture and ecology. The aim is to produce a five-year development plan based on the inventories made of the Montmorency Forest during the summer. | 1 | Undergraduate | Foresterie | 2, 3, 2 | 3, 3, 0, 3 | 1,1 | 3, 2, 3 | Advanced |
| FOR | 2015 | Problém. forestière du Québec | Introduction to policy analysis and decision-making in public administration. Description and study of the forest environment in Québec. Development of the forestry problems of Québec according to economic, social, cultural and environmental axes. The state of Quebec forestry from a global perspective. Exploring the multidimensional nature of the forest. Understanding the ethical foundations of forestry practice in Quebec. | 1 | Undergraduate | Foresterie | 3, 3, 3 | 2, 1, 2, 3 | 3,3 | 2, 3, 2 | Advanced |
| FOR | 2017 | Économie environnem. forestier | Microeconomic concepts applied to the forest environment: business theory, production function and resource use. Economy of supply, technology and innovation: Consumer behavior and demand for forest resources: Balance of markets, externatilities, sustainable development and sustainability of resources. | 1 | Undergraduate | Foresterie | 3, 2, 3 | 3, 3, 1, 2 | 2, 1 | 1, 1, 1 | Introductory |
| FOR | 2019 | Pathologie forestière | Main concepts and types of tree diseases. The agents responsible and their effects on the tree and the forest. Symptomatology, etiology, pathology, epidemiology and control method. This course introduces students to forest pathology from a sustainable development perspective. | 2 | Undergraduate | Foresterie | 2, 2, 2 | 3, 3, 1, 2 | 2, 1 | 2, 1, 2 | Advanced |
| FOR | 2020 | Évaluation environnementale | Understanding of the concept of environmental information. Use of environmental information in the context of an impact study. | 1 | Undergraduate | Foresterie | 3, 2, 2 | 3, 2, 1, 2 | 2, 2 | 2, 1, 2 | Advanced |
| FOR | 2025 | Aménag. écosyst. forêts Québec | Study of the edaphic characteristics, the structure, the floristic composition, the successional dynamics and the functioning of the main forest ecosystems of Quebec: Ecological foundations for the ecosystem based management of these forests and analysis of the main management issues in different blocilmatic areas of | 1 | Undergraduate | Foresterie | 3, 2, 3 | 3, 3, 1, 2 | 2, 1 | 1, 1, 1 | Introductory |
| FOR | 2150 | Dépôts et sols forestiers | the monitors. Large geological ensembles in Quebec. Surface deposits, their shape, composition and geotechnical classification. Soil biology and forms of humus. Texture, structure, porosity and apparent density, Soil water. Notions of chemistry and soil biochemistry. Element Cycle and Stand Nutrition. Pedogenesis, classification and mapping. This course introduces students to geology and pedology from a sustainable development perspective. | 1 | Undergraduate | Foresterie | 3, 2, 3 | 3, 3, 1, 2 | 2, 1 | 1, 1, 1 | Introductory |
| FOR | 2206 | Acériculture | This course presents the concepts, principles and techniques that underlie maple syrup production: assessing the environmental conditions of sugar bushes: Development and shikuculture; Nutrition for sugar bushes: Protection and harmful factors; Infrastructure planning and planning: Physiology of casting and notching: Covernance and production Marketing. This course introduces students to maple syrup production from a sustainable development perspective. | 1 | Undergraduate | Foresterie | 2, 2, 1 | 1, 1, 1, 2 | 2, 1 | 2, 1, 2 | Awareness |
| FOR | 2210 | Hydrologie, amén. bassin vers. | The concepts of the water cycle, water balance and watersheds. Description of the main processes involved in the water cycle (precipitation, evapotranspiration, storage and runoff) and analysis of the impact of spatial planning activities on these processes. Laws and regulations related to water and its protection. Integrated water management by watershed in the Cuebec confect. | 1 | Undergraduate | Foresterie | 2, 3, 2 | 3, 1, 1, 3 | 2,2 | 3, 3, 1 | Advanced |
| FOR | 3101 | Planif. forest. mise en oeuvre | implementation of a general management plan through a five-year program: analysis and implementation of the objectives of the management strategy, construction of cutting sites, planning of access to the territory, cost balancing Exploitation by simulation, analysis of the gap between the five-year program and the management strategy. | 1 | Undergraduate | Foresterie | 3, 3, 1 | 3, 2, 0, 3 | 3, 3 | 3, 3, 3 | Advanced |
| FOR | 4035 | Sylviculture | Review of ecological requirements of major commercial species. Silvicultural treatments and strategies applicable to the various stands to promote their regeneration, growth, pest resistance and stem quality. Biological, environmental, technical and economic aspects of reforestation. | 1 | Undergraduate | Foresterie | 2, 2, 0 | 0, 1, 0, 2 | 0, 0 | 1, 0, 0 | Awareness |
| FOR | 4036 | Hydrologie de l'environnement | This course, based on a problem-based learning approach, proposes to the student to solve targeted territorial management problems where hydrology is at the heart of reflections. As a team, students must use a structured work method to acquire the knowledge and skills required to suggest a realistic, comprehensive and coherent solution to the proposed problems. | 1 | Undergraduate | Foresterie | 3, 3, 3 | 3, 3, 2, 3 | 1, 2 | 3, 3, 3 | Advanced |



| Соц | ırse | Name | Description | # of | Level | Department | | 4 Key Com Anticipatory | | Strategic | Integration into |
|-----|------|--------------------------------|--|------------|---------------|------------------------------|---------|---------------------------|------|-----------|--------------------------------|
| FPT | 3000 | Formation profess. & technique | Study of the nature, issues and role of vocational and technical training in general and related trades, techniques and disciplines in particular. An analysis of the historical, social, political, ethical, economic and ecological contests in which they operate identification of environments and organizations active in vocational and technical training. Focus on their contribution to the preservation and development of civilization, the environment, peace and the fulfillment of individuals. | Sections 1 | Undergraduate | Formation prof. Et technique | 3, 2, 2 | 3, 1, 1, 2 | 1, 2 | 2, 3, 2 | Sustainability Introductory |
| FRN | 1914 | Communicat. pour scientifique | The course is aimed at students of scientific or technical programs who wish to acquie an effective method for communicating complex concepts. It focuses on the analysis and synthesis of texts and includes an introduction to scientific vulgarization, especially from a sustainable development perspective. | 3 | Undergraduate | Français | 1, 1, 1 | 1, 1, 1, 1 | 1, 1 | 1,1,1 | Awareness |
| GAA | 7003 | Infiltration et drainage | Theory of flows in saturated and unsaturated porous media. Application of appropriate differential equations to drainage and infiltration problems. Construction and analysis of water balance models in soils. This course studies water management from a sustainable development perspective. | 1 | Graduate | Génie agroalimentaire | 0, 1, 0 | 1, 0, 0, 1 | 0, 0 | 1, 0, 0 | Advanced |
| GAD | 1003 | Org. & législation de service | Principles and methods for the development of a document management program, policy development, business planning and management of available human, material and physical resources. This course studies human resource management from a sustainable development perspective. | 1 | Undergraduate | Archivistique | 1, 1, 1 | 1, 1, 1, 1 | 1, 1 | 2, 1, 1 | Awareness |
| GAE | 1000 | Concepts génie agroenvironnem. | Study of the basic concepts in applied engineering in the various fields of agro-food engineering. Application of utility software in agh-food engineering Power transmission. Seeding, fertilizing and spraying apparatus. Capacity, selection and cost of agricultural machiney. Water content of soil and agricultural products. Psychrometry of the air. Fuild frow Pumps and fans. Control of the environment by thermostal and hygrostal. Basic elements of arm buildings, introduction to litery work and leveling. This course studies topics in the agro-food field from a sustainable development perspective. | 1 | Undergraduate | Génie agroalimentaire | 2, 2, 2 | 2, 2, 1, 2 | 0,0 | 1, 0, 1 | Awareness |
| GAE | 1001 | Probl. environn. agroaliment. | This course examines the importance of the environment for agriculture and agri-food, environmental issues, the concept of sustainable agriculture, the balance sheet approach, the environmental indicators approach, the means of intervention, are | 1 | Undergraduate | Génie agroalimentaire | 2, 2, 2 | 2, 2, 0, 2 | 0, 0 | 2, 0, 1 | Awareness |
| GAE | 1900 | Introduction au génie rural | St unit systems. Principles of environmental control for animal and plant production. Principles of mechanization of crop production and conservation of agricultural products. Hydrological cycle. Engineering aspects of water management and soil conservation. | 1 | Undergraduate | Génie agroalimentaire | 1, 1, 2 | 2, 1, 1, 0 | 1, 1 | 1, 1, 1 | Awareness |
| GAE | 2000 | Hydrologie agricole & envir. | Climate and hydrology, Frequency analysis. Watershed. Precipitation. Infiltration. Evapotranspiration. Hydrograms. Separation of the hydrograph. Volume of runoff. Classification of pollutants. Mechanisms of diffuse agricultural pollution. Nitrogen and environment. Pollution by phosphorus. Organic contaminants in the environment. Transformation of pesticides. Hydrological | 1 | Undergraduate | Génie agroalimentaire | 2, 2, 1 | 2, 2, 0, 1 | 0, 1 | 2,1,1 | Advanced |
| GAE | 2004 | Gest. sous-produits agroalim. | modeling of water quality. Composition of by-products in agriculture and food. Biosecurity. Environmental considerations. | 1 | Undergraduate | Génie agroalimentaire | 2, 2, 1 | 2, 2, 0, 2 | 1, 0 | 2, 1, 2 | Awareness |
| GAE | 3000 | Design de machines agricoles | Study of the design and development of machines and equipment used to carry out the various agricultural operations; sol-machine product interactions, choice of materials, dimensioning and assembly, power transmission. Technico-economic analysis of agricultural mechanization. This course studies the agro-food field from a sustainable development perspective. | 1 | Undergraduate | Génie agroalimentaire | 3, 2, 2 | 3, 3, 0, 3 | 3, 2 | 2, 1, 1 | Advanced |
| GAE | 3001 | Drainage | Underground drainage in Quebec. Principles and methods of soil remediation. Principles of underground flow. Drainage models. Deslay criteria. Groundwater control and underground irrigation. Filter materials. Installation. This course studies water management from a sustainable development perspective. | 1 | Undergraduate | Génie agroalimentaire | 1, 1, 2 | 3, 2, 0, 2 | 1, 1 | 1, 0, 0 | Advanced |
| GAE | 3003 | Projet d'ingénierie I | Evolution of the career of the engineer. Types of engineering projects. Cycle of a project. Professional service offerings. Contact with customers. Project planning, Plans and specifications. Bicks and bonds. Optimization mechanisms. Supervision and management of building sites. Reports of engineers. Consultation files. This course integrates the knowledge and competencies acquired throughout the studies in appropriate for a sustainable development prospecting. | 1 | Undergraduate | Génie agroalimentaire | 0, 0, 0 | 1, 1, 0, 1 | 0,0 | 0, 1, 0 | Awareness |
| GAE | 3004 | Projet d'ingénierie II | Continuation of work initiated in the course Engineering project I. Methods of carrying out engineering projects: analysis of information, preparation of specifications, calculation methods, preparation of plans, oral presentations, writing of engineer reports. This course integrates the knowledge and competencies acquired throughout the studies in engineering from a sustainable | 1 | Undergraduate | Génie agroalimentaire | 0, 0, 0 | 1, 1, 0, 1 | 0, 0 | 0, 1, 0 | Awareness |
| GAE | 3005 | Amén. cours d'eau, cons. sols | devalopment nestonethus Basic notions in free surface flow hydraulics. Management of watercourses. Management of grassed waterways. Culverts. Protective structures. Energy-dissipating thresholds. Water and wind erosion. Evaluation of soil erosion tosses. Soil conservation techniques. Development of aquatic habitats. This course studies water management from a sustainable development perspective. | 1 | Undergraduate | Génie agroalimentaire | 2, 2, 2 | 3, 2, 0, 2 | 1, 1 | 2, 1, 0 | Advanced |
| GAL | 2000 | Manutention emballage aliments | Principles of handling. Conveyors and forklifts. Physical properties of products. Handling of fruits and vegetables. Security Food packaging. Diffusion in packaging. Packaging and shelf life of lood. Storage. Design of handling systems and packaging. Sustainable development in food hygiene and distribution. | 1 | Undergraduate | Génie alimentaire | 1, 1, 1 | 1, 1, 0, 1 | 0, 0 | 1, 0, 0 | Awareness |
| GCI | 1000 | Matériaux de construction | Acquire some basic knowledge of materials science. Know the different properties of building materials (steel, bituminous materials and cement concrete) commonly used in civil engineering. Learn the rules of use of these different materials. This course studies materials in construction from a sustainable development perspective. | 1 | Undergraduate | Génie civil | 2, 1, 2 | 2, 2, 1, 1 | 1, 1 | 1,1,0 | Awareness |
| GCI | 1003 | Eaux vives | Scientific culture course addresses successively the following 14 themes: the origin and properties of water; Water, universal solvent: Coroundwater; the rivers; Lakes and reservoirs; ice: The waves and the tide: The uses of water; the lack of water; Water, health and culture; dams: Transboundary waters; climate changes; Natural disasters. | 2 | Undergraduate | Génie civil | 3, 2, 2 | 2, 1, 2, 2 | 1, 2 | 1, 2, 1 | Introductory |



| Cor | roo | Nome | Description | # of | Lovel | Department | Customo | 4 Key Com | | Ctratagia | Integration into |
|-----|------|--------------------------------|--|------------------|---------------|------------------|---------------------|--------------|-----------|-----------|------------------|
| COL | irse | Name | Description | # of Sections | Level | Department | Systems Thinking | Anticipatory | Normative | Strategic | Sustainability |
| | | Mécanique des sols II | This course begins with a treatment of stresses and elastic deformations in the soil. We then discuss the theory of unidimensional consolidation and the classical break criteria, for example the Mohr-Coulomb criterion. The course concludes with the integration of consolidation and shear strength in the framework of critical soil mechanics. This course studies soil mechanics from a sustainable development perspective. | 1 | Undergraduate | | 2, 2, 3 | 2, 1, 2, 2 | 2, 2 | 3, 2, 1 | Awareness |
| GCI | 2009 | Hydrologie | Main components of the hydrological cycle. Precipitation, infiltration, evaporation and evapotranspiration, runoff. Watershed. Phases of water. Frequency curve and return period. Metamorphosis and melling snow. Mechanics of underground flows. Recharge of the tablecloths. Estimation and forecasting of floods. Exploitation of water. Flow rates. This course studies water management from a sustainable development perspective. | 2 | Undergraduate | Génie civil | 1, 1, 1 | 0, 0, 1, 0 | 1, 2 | 1, 2, 0 | Awareness |
| GCI | 2010 | Laboratoire d'hydraulique | Practical work carried out in the hydraulic laboratory. Multiple manipulations make it possible to introduce students to practical hydraulics by familiarizing themselves with measuring instruments, checking certain principles related to hydraulics and comparing the results obtained in laboratory with those proposed in the reference books. This course studies water management from a sustainable development perspective. | 2 | Undergraduate | Génie civil | 1, 0, 0 | 0, 1, 0, 0 | 0, 0 | 0, 0, 0 | Awareness |
| GCI | 2012 | Hydraulique urbaine | Theoretical and practical knowledge needed to design drinking water distribution systems (catchment, adduction and distribution) and collection of sanitary and stomwater. Design Standards. Familiarization with the operation, maintenance, auscutlation, rehabilitation and renovation of networks. This course studies water management from a sustainable development perspective. | 1 | Undergraduate | Génie civil | 1, 1, 1 | 2, 2, 2, 0 | 1, 1 | 1, 0, 0 | Awareness |
| GCI | 2102 | Gest. int. déchets sol. munic. | This course aims to give undergraduate students an introduction to the problem of waste management in cities by focusing on domestic waste; the policy and legislative framework related to waste, sources and characteristics of waste, Collection and transport of waste, waste management strategies - selective collection, recovery and recycling, waste disposal methods design and design of landfill sites, incineration and introduction to management plans Integrated waste management. | 1 | Undergraduate | Génie civil | 3, 3, 1 | 3, 2, 1, 2 | 3, 1 | 2, 3, 2 | Introductory |
| GCI | 3001 | Impacts environnementaux | This course introduces students to impact studies and presents the methodological tools for such studies, it includes a review of the federal and provincial processes for assessing impacts and the regulatory framework: Review of available methods, case studies on recent projects. The detrification and management of conflicts in relation to environmental impacts. Concepts of environmental area. | 1 | Undergraduate | Génie civil | 3, 3, 3 | 3, 2, 1, 2 | 1, 2 | 2, 2, 2 | Advanced |
| GCI | 3101 | Projet d'hydraulique urbaine | Design of a stormwater collection and management system (conventional stormwater system, introduction to optimal management practices) and a sewage collection system using SWMM software. Operation of a drinking water distribution system from source to tap using EPANET software. This course studies water management from a sustainable development perspective. | 1 | Undergraduate | Génie civil | 1, 1, 1 | 2, 2, 2, 0 | 1, 1 | 1, 0, 0 | Awareness |
| GCI | 3201 | Aménagement hydraulique | Design and dimensioning of hydraulic structures. Study of the forces generated by current, waves and ice. Examples of applications for culverts, tridge pillars, dams, reservoirs and port facilities. Control structures, valves and thresholds. This course studies water management from a sustainable development perspective. | 1 | Undergraduate | Génie civil | 3, 3, 3 | 3, 3, 3, 3 | 3, 3 | 3, 3, 3 | Awareness |
| GEX | 4000 | Eau, assain. pays en développ. | This course introduces the student to the principles of public health engineering in developing countries. It focuses on appropriate and sustainable water and sanitation technologies that are used in development and humanitarian emergencies. | 1 | Undergraduate | Génie des eaux | 1, 1, 2 | 2, 1, 1, 2 | 1, 1 | 1, 1, 1 | Awareness |
| GGL | 2601 | Analyse, modél. syst. naturels | Presentation of methods of data analysis and modeling taking into account the heterogeneity and anisotropy of natural environments. Regression, Classification. Time series and spatial variability. Geostatistical notions. Interpolation, numerical methods. Use of software (MATLAB) to solve problems associated with Earth sciences. This course studies applied earth sciences from a sustainable development perspective. | 1 | Undergraduate | Génie géologique | 2, 3, 3 | 3, 2, 1, 1 | 0, 1 | 3, 1, 1 | Introductory |
| GGR | 1000 | Introduction carte du monde | A reasoned study of the configuration and relative position of the major regions of the world. Analysis of their distinct geographical content on the one hand and the dominant and common trails on the other. Particular attention is given to the historical foundations of state formation, to current political events, sustainable development and to its roots. | 3 | Undergraduate | Géographie | 1, 1, 2 | 2, 1, 1, 1 | 0, 1 | 0, 1, 1 | Awareness |
| GGR | 1006 | Changements climatiques | Introduction to the climate system and its functioning. Balance and characteristics of the main greenhouse gases. Introduction to climate modeling, scenarios and model predictions. Analysis of the impacts of climate change on the physical and human environment. Adaptation measures to miligate climate change. International agreements and the situation in Canada. | 2 | Undergraduate | Géographie | 2, 2, 3 | 2, 2, 1, 1 | 1, 1 | 1, 1, 0 | Introductory |
| GGR | 1008 | Environnements naturels | This course introduces students to basic data to undestand the distribution and main characteristics of terrestrial blomes (warm, temperate and cody) and aquatic (martine and late) blomes of the planet. Almospheric-ocean continental interactions are also important themes addressed in this course, as well as the disturbances of natural environments illustrated by specific case studies (examples of species introduction, forest fires, volcanism, cases of environmental toxicity). | 2 | Undergraduate | Géographie | 2, 2, 2 | 1, 1, 1, 1 | 0, 0 | 0, 0, 0 | Awareness |
| | | Fondements du tourisme durable | The main objective of this course is to provide conceptual and management tools to integrate the principles of sustainable development into the development and commercialization of tourism products. | 1 | Undergraduate | | 3, 3, 3 | 3, 0, 1, 3 | 3, 3 | 3, 2, 3 | Advanced |
| GGR | 2101 | Géographie politique | Ancient heritage of political geography: its origin, its reasons for being its limits. Contemporary approaches: orientations, levels of analysis, fields of study. The role of the State in geopolitical analysis. Elements of geopolitics: representations: borders: The different scales of analysis. This course studies geography and geopolitical systems from a sustainable development perspective. | 1 | Undergraduate | Géographie | 1, 1, 1 | 1, 0, 0, 1 | 0,0 | 1, 0, 0 | Awareness |



| C | ire^ | Name | Description | # Of | Lovel | Department | Cuptom - | 4 Key Com | | Stratogic | Integration int- |
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| COL | irse | Name | Description | # of Sections | Level | Department | Systems Thinking | Anticipatory | ivormative | strategic | Integration into Sustainability |
| GGR | 2102 | Géographie régionale du Québec | This course raises the problem of the region, regionalization and interregional relations on the territory of Quebec. It alms to: know and evaluate the foundations of the regional divisions in force in Quebec: Recognizing the differentiation of regional spaces on the natural, historical, economic, social, political and cultural levels: To analyze the relations between them, their links to broader groups (national, continental, global) and the role of the State in the development and management of their territories. This course studies geography from a sustainable development perspective. | 1 | Undergraduate | Géographie | 2, 2, 2 | 2, 1, 2, 1 | 1,2 | 0, 1, 0 | Awareness |
| GGR | 2507 | Géographie du Canada | Through a regional and thematic approach, the course helps to acquire geographical knowledge about contemporary Canada while promoting an understanding of the historical context and its evolution. This course studies geography from a sustainable development perspective. | 1 | Undergraduate | Géographie | 1,2,1 | 1, 1, 0, 1 | 0, 1 | 1, 1, 0 | Awareness |
| GGR | 3102 | Terr., ress.: persp. autocht. | In the postcolonial, environmental and multicultural context of the day. Aboriginal issues and perspectives are fundamental to the fair distribution of resources and harmonious conhabitation among all the cultural communities that share Quebec's territory. | 1 | Undergraduate | Géographie | 2, 2, 3 | 2, 1, 3, 2 | 2, 3 | 2, 2, 2 | Awareness |
| GGR | 7051 | Chang. clim.: conséq., adapt. | This course focuses on the impacts that climate change can have on natural and human systems, the adaptive capacity and | 1 | Graduate | Géographie | 3, 3, 2 | 3, 1, 1, 2 | 1, 1 | 3, 2, 2 | Introductory |
| GGR | 7052 | Att. chang. clim.: écon., pol. | unbreability of these systems. This course provides a detailed overview of the major emitters of greenhouse gases in the world, by sector and country. It assesses and analyses the costs of climate change. The miligation measures associated with different sectors of activity (energy production, transport, construction, industry, forestry, agriculture and waste management) are studied thoroughly and critically. | 1 | Graduate | Géographie | 2, 2, 2 | 3, 3, 1, 2 | 3, 2 | 2, 2, 2 | Introductory |
| GIE | 6000 | Données fondamentales mondial. | This course on globalization and the international cultural environment is above all a general culture seminar aimed at providing participants with a global view of the main contemporary international issues and a general knowledge of the state of the world by major geographical regions. This includes environmental, economic and social contexts. | 1 | Graduate | Gestion internationale | 2, 2, 2 | 2, 1, 1, 2 | 1, 1 | 2, 1, 1 | Awareness |
| GIE | 6025 | Relat. Nord-Sud: enjeux éth. | inconomic and social contexts. This course invites the student to reflect on the ethical dimensions of their intervention as a manager in international aid projects. Moral dilemmas are approached from three angles: the stakes of international aid as a sector of human and economic activity, the stakes that concern the organization, and those that challenge the manager in their daily activity. This course addresses, among other things, mutual respect for culture, values and behavior, and the pursuit of greater equity in relationships with populations, governments, aid agencies, donors, etc. | 1 | Graduate | Gestion internationale | 2, 3, 3 | 3, 3, 3, 3 | 3, 3 | 3, 3, 3 | Advanced |
| GIE | 6031 | Thèmes émergents en dév. int. | The aim of this course is to enable students to learn more about current issues related to the management of international development and humanitarian action (DNH4) and to develop their capacities for critical analysis on how these topics are implemented by the actors in developing countries or in situations of humanitarian crisis. The main issues addressed in this context are: governance, fragile states and the protection of populations; Health and food security. Gender and human rights: Conflict interventions and entrepreneurial development. | 1 | Graduate | Gestion internationale | 2, 2, 2 | 2, 2, 1, 2 | 2,2 | 3, 2, 2 | Awareness |
| GIE | 6033 | Gestion projets humanitaires | This course covers the practical and operational aspects of humanitatian action, such as the various intervention programs, concrete cases of humanitatian action, the various intervention plans, management of project teams, logistical aspects, etc. This course allows the student to understand how practical the operational management of humanitatian action is. Is main focus is on the development of skills for the preparation of an intervention plan and management of humanitarian action. This course also develops competencies relating to cultural openness linked to humanitatian projects from a sustainable development perspective. | 1 | Graduate | Gestion internationale | 2, 2, 2 | 2, 2, 1, 2 | 2, 2 | 3, 2, 2 | Awareness |
| GIE | 6043 | Innovation pays émergents | This course focuses on new markets with untapped growth potential and strategies to serve them, as well as the situation of people living below the poverty line and solutions to help them. Ethical thinking and social justice are discussed from a sustainability perspective. | 1 | Graduate | Gestion internationale | 2, 3, 2 | 3, 2, 0, 1 | 1, 1 | 2, 2, 2 | Advanced |
| GIE | 6081 | Rel. hum. en affaires intern. | This course addresses the main problems caused by the need to work with people different from us. It addresses practical implications of the international dimension on tracillitional human resources management (HRM) activities and the preponderant role or cultural and enhical differences. As such, a cultural oppenness and interpersonal competency is developped, as well as a social prespectus on sustainable featerpens. | 1 | Graduate | Gestion internationale | 2, 2, 2 | 1, 1, 1, 1 | 2, 3 | 2, 2, 1 | Awareness |
| GIN | 3110 | Envir., cycle de vie produits | as a social nersonertus on sustainable deuelorment impact studies. Methodological tools for such studies: includes review of federal and provincial impact assessment processes and their regulatory framework. Review of available methods, case studies on recent projects; Determination and management of environmental impact cordificts. Concepts of environmental audit. Methods of analysis and evaluation of the product life cycle (design, manufacture, assembly, distribution, operation, maintenance, recovery, recovery or clean disposal). ISO standard on the environment. | 1 | Undergraduate | Génie industriel | 3, 3, 3 | 3, 3, 2, 3 | 3, 3 | 2, 2, 3 | Advanced |
| GLG | 1000 | Planète Terre | This course is intended for a broad academic audience, consisting of both those who wish to improve their education in science or engineering, and those who are interested in learning about their physical environment. Environmental geology and hisotry are studies from a sustainable development perspective. | 3 | Undergraduate | Géologie | 2, 2, 2 | 2, 1, 0, 0 | 0, 0 | 1, 0, 0 | Awareness |
| GLG | 1900 | Introd. sciences de la Terre | Engineering concepts related to Earth sciences: applied hydrogeology, soil and rock mechanics, building materials, adaptation to climate change. | 1 | Undergraduate | Géologie | 0, 0, 0 | 0, 0, 0, 0 | 0, 1 | 0, 1, 0 | Other |
| GMC | 1002 | Introd. à la thermodynamique | Basic Concepts and Definitions, Properties of pure substances, balance of phases, tables of thermodynamic variables. Work and warmth. Notions of control systems and volumes, Fist principle. Second principle. Notions of machines, refrigerators and thermal pumps, Yields, Entropy, Perfect gas mixtures: volumetric and gravimetric analysis, properties. The role of thermodynamics in sustainable development. | 1 | Undergraduate | Génie mécanique | 1, 1, 1 | 2, 2, 1, 1 | 1, 0 | 1, 1, 0 | Awareness |



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| Cou | rse | Name | Description | # of Sections | Level | Department | Systems Thinking | Anticipatory | Normative | Strategic | Integration into Sustainability |
| GMC | 2009 | Conception systèmes production | Production systems: history, characteristics and methods of analysis. Methods and models of operational research. Introduction to linear programming. Methods of resolution. Graphical method and simplex method. Theory of duality and sensitivity analysis. Transportation and assignment problems. Theory of graphs and networks. Shortest path algorithms. Trees and cover shafts. Maximum flow in a graph (Ford-Fulkerson algorithm). Flot at minimum cost. Project planning and control: CPM-PERT and PERT-Cost. The design of a production system, the analysis of the product, the process and the capacity; methods and economic analysis. Location, layout and handling. This course also develops competencies relating to efficiency and management of material resources from a sustainable development perspective. | 1 | Undergraduate | Génie mécanique | 0, 0, 1 | 1, 0, 0, 1 | 0, 1 | 1, 0, 0 | Awareness |
| GMC | 3012 | Intr. méc. bát ,énerg. renouv. | This course is an introduction to building mechanics, covering the following topics: air conditioning, humlid air, thermal comfort, indoor air quality, building heat, heating load, solar radiation, cooling load, Energy simulation, fluid distribution networks, lighting. In addition, part of the course is devoted to renewable energies. In particular geothernal energy and solar energy. Finally, the course offers students the opportunity to reflect on the importance of energy in our lives, in a context of sustainable development. | 1 | Undergraduate | Génie mécanique | 2, 2, 2 | 3, 3, 1, 2 | 3, 3 | 3, 3, 1 | Advanced |
| GMC | 4350 | Turbomachines | Theory of axial and radial turbomachines (pumps, turbines, compressors, etc.), momentum, speed triangles. Principles of operation, similarly, characteristic curves, use in parallel and in series, entropy-enthalpy diagrams. Pressure losses and leaks, cavilation, yields. Elements of design and evaluation of turbomachine systems, behavior outside normal rpm. The importance of energy efficiency from a sustainable development perspective. | 1 | Undergraduate | Génie mécanique | 1, 0, 0 | 1, 0, 0, 1 | 0, 0 | 2, 0, 0 | Awareness |
| GMN | 2005 | Environn. minier, métallurgiq. | Sustainable development in the mining and metallurgical industry. Environmental problems of the metallurgical industry. Contribution to the problems of greenhouse gases and acid rain. | 2 | Undergraduate | Génie minier | 3, 3, 2 | 3, 3, 1, 2 | 2, 2 | 2, 1, 1 | Advanced |
| | | Ress. énergétiques et envir. | This course presents energy resources, their use in the modern world and their effect on the environment. It covers the production, transmission, conversion and consumption of non-cenewable and renewable energies in our society. It also highlights the economic aspect of their extraction and the environmental impact of their use. Finally, it presents energy afficiency and consensation of energy. History and evolution of city planning. Urban functions. | 1 | Graduate | Genie minier | 3, 3, 3 | 3, 3, 3, 3 | 1, 1 | 3, 1, 3 | Advanced |
| GWI | 1100 | Urbanisme fondamental | Terminology. The territory and its shaping fural and urban forms). Planning scales. The regulatory framework. The urban planning file. Sustainable planning. Planning instruments. Public spaces. Selective bibliographic overview. | 1 | Undergraduate | Geomanque | 3, 2, 3 | 3, 2, 2, 1 | 1, 2 | 2, 2, 1 | Advanced |
| | | Cadastre | The cadastre: definition, origin, typology and evolution. The cadastre of Cuebec: history, nature, utility, mode of realization, legal framework and standards of execution. Environmental Regulation: zonage rules, land-use conflicts, sustainable development. | 1 | Undergraduate | Géomatique | 1, 0, 2 | 2, 2, 0, 0 | 1, 1 | 1, 2, 0 | Awareness |
| GMT | 6009 | Systèmes cadastraux | Introduction to cadastral systems. Origins, missions and evolution of the cadastra. Technical characteristics and legal framework. Mullipurpose use of cadastral systems: development, development. Study of the cadastra of Ouebec. Presentation of foreign cadastres. Environmental Regulation: zonage rules, landuse conflicts, sustainable development. | 1 | Graduate | Géomatique | 2, 1, 2 | 2, 1, 0, 2 | 2, 1 | 1, 2, 1 | Introductory |
| GMT | 7008 | Qualité données géospatiales | The aim of this course is to present methods, techniques and concepts relevant to the assessment of the quality of geospatial data. Internal quality (accuracy, jodical coherence, completeness, etc.) and external quality (usage, risk management, legal aspects, etc.) are discussed. Furthermore, the environmental sustainability consequences of geospatial data collection and analysis are discussed. | 1 | Graduate | Géomatique | 2, 2, 1 | 2, 2, 1, 2 | 2, 1 | 2, 2, 2 | Awareness |
| | | Géomatique environnementale | Introduction to basic notions and concepts in environmental geomatics. Presentation of the principles governing the development and management of territories and natural resources supported by geomatics. Nature of geospatial information used for management, assessment and description of the environment. Presentation of geomatic approaches to environmental impact situdies. | | Graduate | Géomatique | 3, 3, 3 | 3, 3, 3, 3 | 2, 3 | 2, 2, 2 | Advanced |
| GMT | 7015 | SIG et analyse spatiale | Theoretical and practical knowledge required for the processing and analysis of geospatial data of vector, matrix, network and three-dimensional types and then automation of these treatments. The sustainable-development perspective on geospatial data collection. | 2 | Graduate | Géomatique | 1, 1, 2 | 2, 1, 0, 2 | 0, 0 | 2, 2, 1 | Awareness |
| | | Travail d'équipe, comp. humain | This course aims to make the participant aware of the interaction phenomena that occur in a working group. Through modern methods, students are placed in the context of perception, molivation, leadership, tearmwork, communication, etc. Emphasis will be placed on the interactions that occur in the group. This course allows students to acquire interpersonal competencies for conflict resolution from a sustainable development perspective. | 1 | J | Gestion des ress. Humaines | 2, 2, 2 | 2, 2, 2, 2 | 2, 1 | 3, 2, 2 | Introductory |
| | | Méthodologie de design en ing. | This course allows the student, in a team of six or seven members, to acquire and perfect, by carrying out a design project, skills in teamwork, engineering project management and communication from a sustainable development perspective. | 8 | Undergraduate | Génie et sciences | 2, 2, 1 | 2, 1, 1, 2 | 0, 0 | 2, 1, 0 | Awareness |
| | | Macroéconomie financière Opérations et logistique | The fundamentals of modern macroeconomics and linkages with finance. Gross domestic product, unemployment, initiation, determination of the interest rate and the role of financial institutions. Economic growth, sustainable development, meverance and international tracts function of a manufacturing organization. The content focuses on different types of production systems, inventory management, overall production planning, material needs planning, project management, scheduling, quality management, maintenance, development, transport management, steep selection. This in turn alligns the student of acquire a | 8 | , and the second | Gestion financière Gestion des opérations | 2, 1, 1 | 1, 0, 1, 0 | 0, 1 | 0, 0, 0 | Awareness Awareness |
| | | | site selection. This, in turn, allows the student to acquire a knowledge base in operations and logistics, as well as material resource management, from a sustainable development perspective. | | | | | | | | |



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| Col | urse | Name | Description | # of Sections | Level | Department | Systems Thinking | Anticipatory | Normative | Strategic | Integration into Sustainability |
| GSO | 6005 | Opérations | The aim of this course is to introduce the student to the techniques to better manage the supply, production and distribution functions of a company, and to show them how to choose, among all the accessible techniques, that which is best suited to a given market and competitive environment, especially within a sustainable development context. | 4 | Graduate | Gestion des opérations | 3, 3, 1 | 2, 1, 0, 1 | 1, 1 | 2, 1, 3 | Awareness |
| GUI | 2103 | Immobilier et dével. durable | Introduction to the general principles of building construction in a context of sustainable development. Fundamentals of Building Materials, Components and Assemblies: foundations, structures, enclosures, openings, covers and mechanical systems. Best practices in sustainable development in real estate, including the study of LEED and BOMA certifications. | 2 | Undergraduate | Gest. Urbaine et immobilière | 2, 2, 2 | 3, 1, 3, 3 | 1, 3 | 2, 2, 1 | Advanced |
| GUI | 6100 | Écon. urbaine, marchés immob. | The course deals with the study of urban and real estate markets from an economic point of view and requires a minimum understanding of the concepts and instruments of microeconomic analysis. If then analyses real estate markets from the sustainable development perspective. | 3 | Graduate | Gest. Urbaine et immobilière | 2, 2, 2 | 2, 2, 1, 2 | 0, 1 | 2, 1, 2 | Awareness |
| HST | 1004 | Introd. civilisations antiques | The Mediterranean as a catalyst of civilizations in the ancient world: the Near East, Greece and Rome. Overview of long-term phenomena; Sketch of the diversity of social realities; Continuity of commercial and cultural relations with the Near East, forms of transfers of civilization. Great migrations. Lessons from Ancient history for modern sustainability. | 1 | Undergraduate | Histoire | 2, 2, 2 | 2, 1, 1, 1 | 0, 1 | 1, 2, 0 | Awareness |
| IFT | 1903 | Informatique pour l'ingénieur | Problem solving approach in engineering. Elements of algorithmics required to solve the proposed problems. Verification and validation of the answers obtained from the software used. Introduction to Maple software for symbolic calcutations and Matlab for numerical calculations. IT implications on sustainable development. | 3 | Undergraduate | Informatique | 2, 2, 3 | 2, 1, 2, 2 | 2,2 | 3, 2, 1 | Awareness |
| MCB | 3003 | Écologie microbienne | The main themes of microbiology are studied for their ecological aspects. The notion of microbial ecology is presented and applied to different systems: microbial habitats (aerial, terrestrial and aquatic), population interactions, biogeochemical cycles, biodegradation, pollution and waste recycling. | 1 | Undergraduate | Microbiologie | 2, 1, 1 | 2, 2, 0, 1 | 1, 0 | 0, 0, 1 | Introductory |
| MED | 1209 | Organ. sens fond. probl. clin. | This basic course aims to acquire knowledge relevant to the understanding of common clinical problems related to oloalyngology and ophthalmology. The student will be able to identify the clinical signs, to confront them with the diagnostic hypotheses, to explain the anatomophysiopathology and the principles of investigation and treatment. This course studies these clinical cases from the perspective of sustainable health. | 1 | Undergraduate | Médecine | 2, 2, 2 | 3, 3, 3, 2 | 2,3 | 2, 3, 1 | Awareness |
| MED | 1217 | Psychisme : fond. probl. clin. | This basic course aims to acquire knowledge relevant to the understanding of common clinical problems affecting mental health. The student will be able to identify the clinical signs, to confront them with the diagnostic hypotheses, to explain the psychopathological causes and the principles of investigation and treatment. This course studies these clinical cases, as well as integrated patient management, from the perspective of sustainable health. | 1 | Undergraduate | Médecine | 2, 1, 0 | 0, 3, 0, 0 | 3, 0 | 0, 0, 0 | Other |
| MED | 1222 | Syst. hém. fond. probl. clin. | This basic course aims to acquire knowledge relevant to the understanding of frequent haematological clinical problems. The student will be able to identify the clinical signs, to confront them with the diagnostic hypotheses, to explain the anatomophysiopathology and the principles of investigation and treatment. This course studies these clinical cases, as well as the integrated patient management, from the perspective of sustainable health. | 1 | Undergraduate | Médecine | 0, 0, 0 | 0, 0, 0, 0 | 0,0 | 0, 0, 0 | Other |
| MED | 1228 | Pers. âgées, soins fin de vie | In this intermediate course, the student acquires knowledge about normal aging, the importance of the physician-patient relationship, the relevance of collaborative work and ethical issues. This course studies these clinical cases, as well as the integrated patient management, from the perspective of sustainable health. | | Undergraduate | Médecine | 1, 2, 2 | 1, 2, 0, 0 | 3, 2 | 2, 3, 2 | Other |
| MNG | 1000 | L'entreprise et sa gestion | This course aims to introduce students to the main activities of management in the running of a company, especially from a sustainable business perspective. As a result of the development of a systemic framework setting out the role of managers and the decisions they have to make, the objectives and strategies of the company, planning, organization, management, Control and sharing. | 10 | Undergraduate | Management | 1, 1, 0 | 1, 1, 0, 1 | 1, 0 | 1, 0, 0 | Awareness |
| MNG | 1101 | Gestion croissance d'une PME | This course studies the requirements and the means to manage the growth of an SME, especially from a sustainable business perspective; shares the experience of several small and medium-sized Quebec entrepreneurs working in various fields: allows students to understand the interrelationships between the different activities of the overall small business management process; To recognize the principles and management processes applied in certain existing companies. | 3 | Undergraduate | Management | 2, 1, 1 | 1, 1, 1, 1 | 2, 2 | 1,1,1 | Awareness |
| MNG | 2003 | Planification, gestion projets | This course covers two essential aspects: the creation and the development of a project and its management, especially from a sustainable development perspective. It presents the approaches, the methods and the techniques of the creativity with concrete applications to the emergence and the explanation of a project. Methods and techniques for managing a project are then presented, including planning; the programs; activities; Human, financial and physical action plans; Calendars; And project evaluation. | 4 | Undergraduate | Management | 0, 0, 0 | 0, 3, 0, 0 | 0, 0 | 0, 0, 0 | Introductory |
| MNG | 2109 | Resp. soc. entr., écon. solid. | This course offers conceptual tools and concrete examples to understand, integrate and manage corporate social responsibility (CSR) from the perspective of the social and solidarity economy. | 1 | Undergraduate | Management | 3, 3, 3 | 3, 1, 1, 1 | 2, 2 | 2, 2, 1 | Advanced |
| MNG | 2110 | Dév. durable et gestion org. | The main objective of this course is to provide conceptual and practical tools to understand and efficiently integrate the concept of sustainable development in organizations. | 4 | Undergraduate | Management | 3, 3, 2 | 3, 3, 2, 2 | 2, 2 | 3, 3, 2 | Introductory |



| Cor | ırse | Name | Description | # of | Level | Department | Systems | 4 Key Com Anticipatory | | Strategic | Integration into |
|-----|------|--------------------------------|---|------------------|---------------|----------------|----------|---------------------------|------------|-----------|------------------|
| | | | • | # 01 Sections | FEAGI | o opai untilit | Thinking | - и погратогу | recimetive | Juanegio | Sustainability |
| MNG | 3113 | Gérer décider en situat. crise | Knowing how to deal with crises is a critical issue for all managers. Mobilizing the right relexes, coping with the press and putting in place effective responses to prevention and steering are some of the skills that can be expected of any manager. Understanding the sustainable development aspect of crisis management is also an important competency. | 2 | Undergraduate | Management | 2, 2, 3 | 3, 3, 0, 3 | 0, 2 | 3, 2, 2 | Advanced |
| MNG | 4144 | Transmiss., relève d'entrepr. | This course deals with the different aspects of business transfer, namely transfer of management and transfer of comership, taking into account the various actors involved in the process. Although there is an important place for the transfer of family business, the course also addresses internal (by employees) and external (redemption) transmission, from the social business perspective. | 1 | Undergraduate | Management | 2, 2, 1 | 1, 1, 2, 1 | 0, 1 | 2, 1, 2 | Introductory |
| MNG | 6009 | Systèmes gestion environnem. | Students become aware of the complexity and challenges of environmental management based on case studies, real-life examples and theoretical reflections. Environmental management systems, in particular ISO 14000, serve as the backdrop for a more comprehensive analysis of the human and strategic aspects of sustainable development by organizations. | 1 | Graduate | Management | 3, 3, 3 | 3, 3, 2, 2 | 3, 3 | 3, 3, 3 | Advanced |
| MNG | 6054 | Diversité, équité milieu trav. | This course provides an update on the diversity and equity issues in the workplace for the four target groups (women, visible minorities, persons with disabilities and Abordginal peoples) and the explanations for this state of affairs. Best practices to reduce inequalities are also analyzed from the sustainable development perspective. | 1 | Graduate | Management | 2, 2, 2 | 2, 1, 0, 1 | 1, 2 | 2, 2, 1 | Awareness |
| MNG | 6055 | Gestion des risques et crises | This course aims to identify and define the meaning of crises in contemporary organizations and to develop skills and knowledge in order to intervene appropriately in crises. Through this study, the student will develop competencies in decision-making in a crisis situation from a sustainable development perspective. | 1 | Graduate | Management | 3, 3, 3 | 3, 3, 0, 3 | 1, 3 | 3, 2, 2 | Advanced |
| MNG | 6128 | Gestion développement durable | The main objective of this course is to train a manager who is more concerned with the social and environmental responsibility of organizations by fostering a broader understanding of practices that effectively integrate sustainable development into organizations | 1 | Graduate | Management | 3, 3, 2 | 3, 3, 2, 2 | 2, 2 | 3, 3, 2 | Introductory |
| MNG | 6130 | Leadership | The objective of this course is to support the development of the skills of the current or future leader. Demanding introspection, questioning and openness to change, this course invites the student to determine their stakes, difficulties and aspirations as a leader, to grasp the great forms of power they are called upon to exercise (for example, authority), as well as to articulate a personal development project and implement it throughout the session. This work is undertaken from a sustainable development perspective. | 3 | Graduate | Management | 2, 2, 2 | 1, 1, 1, 0 | 0, 0 | 1, 1, 2 | Introductory |
| MNG | 6155 | Gest. entr. soc. et solidaires | This course presents the challenges of managing social and solidarily enterprises (SSE). It offers students conceptual tools and concrete examples to understand the small, medium and large SSEs that are now present in several sectors of activity and that respond to the socio-economic needs of the communities where they settle. The course also provides concrete means of action that enable SSEs to respond to six sustainable development issues at local, national and international levels. | 1 | Graduate | Management | 3, 3, 3 | 3, 1, 1, 1 | 2, 2 | 2, 2, 1 | Advanced |
| MNG | 6704 | Resp. entr., mod. aff., out. | This course is intended for graduate students and proposes them to change the company 'from the inside' into a market logic, with management tools for generating portiss. But it is aimed above all at managers concerned with building a sustainable, credible CSR approach, driven by a business model that is sustainable and capable of being imitated and spreading in a business context. | 1 | Graduate | Management | 3, 3, 3 | 3, 2, 1, 3 | 2, 3 | 3, 2, 3 | Advanced |
| MRK | 1900 | Marketing touristique durable | Fundamentals of marketing from a sustainable development perspective. Nature of tourism services and role of marketing for | 1 | Undergraduate | Marketing | 2, 2, 3 | 2, 3, 0, 2 | 0, 2 | 2, 3, 1 | Advanced |
| MRK | 6017 | Marketing responsable | organization and territory. Markeling is a discipline that aims to satisfy the needs of consumers. Responsible markeling is an approach that considers the reactions of society, whether explicit (eg laws), implicit (eg, public opinion) or probable (eg, activism) within the context of modern environmental, economic and social sustainability problems. | 2 | Graduate | Marketing | 2, 2, 2 | 2, 1, 1, 2 | 2, 3 | 1, 2, 1 | Introductory |
| MUS | 1020 | Cultures musicales du monde | Introduction to the principles and history of ethnomusicology. An overview of the main musical cultures, both scholarly and popular. Organology: Forms and genes: Links with dance and worship: The place of music in societies. To ask Western musical systems which have existed in parallel or on the margins questions arising from practices of different type, which thing out the specificity of each one. Through this course, students will develop a working knowledge of cultural diversity in a context of social sustainability. | 1 | Undergraduate | Musique | 3, 3, 3 | 3, 2, 2, 3 | 3, 3 | 2, 2, 2 | Awareness |
| MUS | 1704 | Formation à la vie culturelle | The course is built around a series of events (symphonic concert, rectals, opera, theater, exhibition, ballet, etc.) selected in the seasonal programming of various Ouebec cultural organizations, Ouebec (OSO). It has three components: pre-event briefing (with the participation of different guess), event itself, clinical review. Through this course, students will develop a working knowledge of cultural diversity in a context of social sustainability. | 2 | Undergraduate | Musique | 1, 1, 1 | 2, 0, 1, 2 | 1, 1 | 1, 0, 0 | Awareness |
| MUS | 3700 | Gestion de carrière en musique | Presentation and development of the necessary skills and the various resources available for the management and the success of a career in music, especially in a sustainable business context. | 1 | Undergraduate | Musique | 3, 2, 2 | 3, 3, 2, 3 | 3, 3 | 2, 3, 3 | Introductory |
| NUT | 1000 | Méth., pratiques en nutrition | Study of the nature and use of the human nutrition professional's basic tools required for assessing the nutritional quality of the dief: feeding guides, recommenden duration triables, nutritional tables, sustainable health etc. An overview of methods for assessing intake and nutritional status of individuals. Energy requirements and energy inputs from food. | 1 | Undergraduate | Nutrition | 1, 1, 2 | 2, 1, 2, 1 | 1, 2 | 1, 1, 0 | Awareness |



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|-----|------|--------------------------------|--|------------------|---------------|-------------|---------------------|--------------|-----------|-----------|------------------------------------|
| Cou | ırse | Name | Description | # of Sections | Level | Department | Systems Thinking | Anticipatory | wormative | Strategic | Integration into Sustainability |
| NUT | 1104 | Éléments de nutrition | The reference values presented in this course are values used in Canada and the content of this course is Canadian. Study of 'Canadás's Food Guide' and the various nutrients needed by the human body: energy, carbohydrates and dietary fiber, lipids, proteins, valamis, minerals and water. Nature, roles, metabolism, recommendations, dietary sources, effects of deficiencies, sustainable health and excesses for these nutrients. | 2 | Undergraduate | Nutrition | 1, 1, 1 | 3, 2, 0, 1 | 0, 2 | 3, 1, 1 | Awareness |
| NUT | 3001 | Menus des collectivités | Development of the client approach and application of marketing concepts to professional nutrition practice. Development of community menus according to clientele, administrative and therapeutic constraints. Nutritional analysis of menus. Management of the production of community meals. Food quality management hygiene, safety, HACCP, etc. Nutrition and restaurant management in a sustainable development context. | 1 | Undergraduate | Nutrition | 2, 2, 2 | 2, 2, 1, 2 | 1, 2 | 2, 2, 2 | Advanced |
| NUT | 3004 | Nutr. publ. II: interventions | Initiation to professional action in public nutrition. Study of the various strategies that can influence individual behaviors as well as the socio-political environment. How to plan and evaluate nutrition interventions that will respond effectively to identified needs. Discussion on different issues affecting public nutrition: food security, intercultural competences, ethics. | 1 | Undergraduate | Nutrition | 2, 2, 2 | 2, 1, 1, 1 | 0, 0 | 2, 2, 2 | Introductory |
| ORT | 1001 | Neurosciences et langage | Articulate the fundamental knowledge of neuroscience and the cognitive functioning of language: neuroanatomy (lobes and structures of the brain, neurons and networks). Cognitive functions: Sensorimotor functions (somatosensory and motor systems, brain stem, basal gangla). Visual, vestibular and auditory systems: Brain imaging techniques and new diagnostic approaches (tomography, magnetic resonance imaging, electroencephalography, magnetic stimulation of the brain, etc.). The knowledge of language function and ethics necessary to help patients achieve a healthy and productive life in the interest of sustainability in health. | 2 | Undergraduate | Orthophonie | 2, 2, 1 | 1, 2, 2, 1 | 1,2 | 2, 1, 1 | Awareness |
| ORT | 6002 | Counseling et relation d'aide | Theoretical knowledge about the helping relationship. Development of relational skills essential for clinical work with one or more people. Communication skills related to helping relationships in a client-centered approach. This course develops interpersonal competencies related to the helping relationship from the perspective of sustainable health. | 1 | Graduate | Orthophonie | 0, 0, 0 | 1, 1, 0, 0 | 0,0 | 0, 0, 1 | Other |
| PHA | 2072 | Environnem. externe pratique 1 | This training activity allows the student to situate the practice of pharmacy throughout the health system defined in particular from the angles of legislation, structure and programs. Health determinants, indicators and costs are analyzed, while third-party billing by pharmacy is defined and put into practice. The perspectives of sustainability in health permeate the material. | 1 | Undergraduate | Pharmacie | 1, 1, 1 | 1, 1, 1, 1 | 1, 1 | 1, 1, 1 | Awareness |
| РНА | 2082 | Environnem. externe pratique 2 | This training activity allows the student to determine in practice the various helping communities; professional associations and support communities. It allows students to determine the advertising looks that make it possible to distinguish from the competition. It identifies emerging practices, particularly in the context of interprofessional collaboration. Finally, It enables the development and preparation of an individual orgoup educational program for the general public. This course develops student's knowledge of the pharmaceutical profession from the perspective of sustainable health and sustainable development. | 1 | Undergraduate | Pharmacie | 1,1,1 | 1, 1, 1, 1 | 1,1 | 1, 1, 1 | Awareness |
| | | Gestion médicaments et enjeux | This activity takes into consideration certain social aspects related to medicines. This can be seen in the process of developing an innovative or generic drug, patents, marketing and marketing, quality assurance mechanisms, counterfeiling, globalization of the drug chain, pharmacoevonmics, Pharmacovigliance, ethical aspects of drug management and research ethics. This course developes student's knowledge of the pharmaceutical profession from the perspective of sustainable health and sustainable development. This course develops student's knowledge of responsible and ethical management of medications from the perspective of sustainable health and | 1 | Undergraduate | | 1, 1, 1 | 0, 1, 0, 1 | 1,0 | 2, 1, 0 | Awareness |
| PHI | 1064 | Observat. philosophie enfants | This course focuses on the observation of communities of children engaged in the act of philosophizing. It is aimed particularly at the person who wishes to observe, even understand, and then explain to children the main components of the processes of discussing philosophy. This course encourages the developpment of critical thinking, as well as the acquisition of this thinking by children, from a sustainable development perspective. | 2 | Undergraduate | Philosophie | 2, 2, 2 | 3, 2, 2, 2 | 1, 2 | 1, 1, 1 | Introductory |
| PHI | 2130 | Philosophie de la biologie | Study of epistemological issues raised by the methods, theories and concepts of the life sciences. Examination of the specificity of the biological sciences in their relation to the physicochemical sciences. This course develops critical thinking, especially relating to bioethics, from a sustainability perspective. | 1 | Undergraduate | Philosophie | 2, 2, 2 | 2, 1, 1, 2 | 2, 3 | 2, 2, 0 | Awareness |
| PHI | 2140 | Éth., sc. biol.: volet bioméd. | Analysis of professional practices and research on biological sciences, particularly in the biomedical fleid, based on practical cases and in relation to bioethics theories troadened to the philosophies linking human health, technologies and the environment. This course develops critical thinking, especially relating to bioethics, from a sustainability perspective. | 1 | Undergraduate | Philosophie | 2, 2, 2 | 2, 3, 2, 2 | 1, 2 | 2, 1, 1 | Advanced |
| | | Éth., sci. biol.: v. environn. | Analysis of professional practices and research on biological sciences, in particular on the environment, based on practical cases and in relation to environmental philosophies, sustainable development and industrialization. | 1 | Undergraduate | | 2, 2, 3 | 2, 3, 2, 1 | 1, 3 | 3, 1, 1 | Advanced |
| | | Génie et développement durable | This course is intended for students of bachelor's degrees in engineering and aims to introduce the future engineer to the concept of sustainable development and the different philosophical ideas underlying it. | 6 | Undergraduate | | 2, 3, 2 | 3, 3, 2, 2 | 1, 2 | 2, 2, 1 | Advanced |
| PHI | 3900 | Éthique et professionnalisme | Today's professionals face situations that require ethical skills and knowledge that go beyond the technical knowledge of their area of experise. This course develops these ethical thinking skills from the sustainability perspective. | 9 | Undergraduate | Philosophie | 2, 2, 2 | 2, 2, 1, 2 | 3, 3 | 3, 3, 3 | Introductory |



| Cou | ırse | Name | Description | # of Sections | Level | Department | Systems Thinking | 4 Key Con Anticipatory | | Strategic | Integration into Sustainability |
|-----|------|--------------------------------|---|------------------|---------------|-------------------|---------------------|---------------------------|------|-----------|------------------------------------|
| PHI | 7200 | Rech. éth. médic., environnem. | An interdisciplinary research seminar involving professors and graduate students from the Faculties of Philosophy, Law, Theology, Sociology and Medicine. Each year, special topics of research and discussion are offered on the questions posed by technology and medical practice. This course develops eithical thinking and research in medical and environmental sciences from a sustainability perspective. | 1 | Graduate | Philosophie | 2, 2, 2 | 2, 2, 2, 2 | 1, 2 | 2, 1, 1 | Advanced |
| PHT | 2001 | Apprent., rééduc. du mouvement | Theoretical foundations related to functional plasticity. Theories of motor learning, type of learning and principles of practice organization. Integration of these principles into the rehabilitation of movement in clients with musculoskeletal and neurological motor dysfunctions. This course develops knowledge relating to re-education and research on patient independance from the perspective of sustainability in health. | 1 | Undergraduate | Physiothérapie | 3, 2, 3 | 2, 3, 1, 2 | 2, 2 | 3, 1, 1 | Advanced |
| PHT | 3100 | interventions spéc, pédiatrie | Integration of the learning needed to analyze complex cases in the field of pediatric physiotherapy. Deepening of the notions of detection of motor problems. Development of a critical view on the advancement of knowledge with a special focus on alternative and complementary therapies. Reinforcement of relational skills. This course develops interpersonal competencies relation to helping relationships, from the perspective of sustainability in health. | 1 | Undergraduate | Physiothérapie | 3, 3, 3 | 2, 3, 1, 3 | 2, 2 | 2, 2, 2 | Advanced |
| PLG | 1000 | Introd. agricult. biologique | This course presents a historical context of organic agriculture: its definition, its foundations, its objectives, its current structure and its relevance as a strategy for progress towards agricultural | 1 | Undergraduate | Phytologie | 3, 2, 2 | 2, 2, 2, 3 | 2, 3 | 3, 3, 3 | Advanced |
| PLG | 1001 | Productions végétales durables | sustainability Introduction to concepts and techniques of sustainable plant production. Notions of domestication of plants for agriculture, cereal, fodder and market gardening. Sustainable crop management: fertilization and biological control, symbiosis, temperate aeroforestry and trooical crops. | 1 | Undergraduate | Phytologie | 3, 3, 3 | 3, 3, 3, 3 | 3, 3 | 3, 3, 3 | Advanced |
| PLG | 1002 | Anatomie, morphologie végétal. | Phylogenetic study of vascular plants and spermatophytes. Morphology, anatomy, histology and development of vegetative and reproductive organs. In deeph study of vegetative meristems. Elements of floral biology and embryology. Classification of inflorescences and fluits. This course allows students to gain an understanding in vegetable morphology from a sutainable development perspective. | 1 | Undergraduate | Phytologie | 1, 0, 1 | 1, 1, 0, 0 | 0, 1 | 1, 0, 0 | Awareness |
| PLG | 2100 | Aménagement du paysage | The course addresses the issue of public and private development. It deals with the use of plants in a thoughful and environmentally sensitive manner. It also aims to make the manager aware of the landscape in which he intervenes. It contributes to an understanding of the plants in order to choose them well and to place them properly. This course will lead the student to integrate the plant component into the organization of spaces and the creation of residential landscaping, thus creating healthy living spaces from a sustainability perspective. | 1 | Undergraduate | Phytologie | 1, 2, 1 | 2, 2, 1, 2 | 0, 1 | 2, 2, 2 | Awareness |
| PLG | 2101 | Arboric.: princ., prat. entr. | Introduction to the principles of cultivation and maintenance of trees and shrubs in development. Roles and operation of the tree in the environment. Main techniques used in arboriculture. Sensitization to the protection of these plants. | 1 | Undergraduate | Phytologie | 2, 2, 1 | 3, 3, 2, 2 | 3, 2 | 3, 3, 2 | Introductory |
| PLG | 2300 | Agriculture écologique | This course aims to present to the future actors of the agricultural sector the overall picture of organic agriculture in Quebec under the historical, organizational and technical aspects, so that they are able to contribute actively to the sustainable development of this sector. | 1 | Undergraduate | Phytologie | 2, 2, 1 | 1, 1, 1, 2 | 0, 1 | 2, 1, 2 | Advanced |
| PLG | 2303 | Prod. biol. cultures en champ | This course presents principles and practices related to the production and management of field crops in an organic farming context. The modules introduce the student to the general and specific rules associated with organic production standards for various those of claints. | 1 | Undergraduate | Phytologie | 1, 1, 1 | 2, 1, 0, 1 | 1, 1 | 2, 1, 0 | Awareness |
| PLG | 3100 | Séminaire en phytologie | Initiation to writing and oral and visual presentation of intellectual works on topics related to plant biology or crop production, from a sustainable development perspective | 1 | Undergraduate | Phytologie | 1, 1, 1 | 1, 0, 0, 0 | 0, 0 | 1, 0, 0 | Awareness |
| PLG | 3200 | Plantes et cultures d'ornement | Plants used for outdoor ornamentation in Ouebec are growing in number. The characteristics of species and cultivars belonging to more than 140 botanical genera are described after presenting various factors influencing the choice of a plant as well as the main principles of field cultivation and pot cultivation. The environmental conditions that are appropriate for each of them are also mentioned, thus developing the student's knowledge of the sustainability perspective in botany. | 1 | Undergraduate | Phytologie | 2, 2, 1 | 1, 0, 1, 0 | 0, 0 | 1, 0, 1 | Awareness |
| PLG | 3202 | Céréales et maïs | Origin, description and distribution of major cereals and maize. Analysis of factors of production. Determination of major yield losses. Use and marketing of cereals and maize, from a sustainable development perspective. | 1 | Undergraduate | Phytologie | 2, 2, 1 | 1, 1, 2, 2 | 1, 1 | 2, 1, 1 | Awareness |
| PLG | 3205 | Plantes nuisibles | Part 1: biology, ecology and physiology of weeds. Notions of interference, competition and allelopathy. Part Two: Principles of Weed Control: Cultural, Biological and Chemical Struggles. Overall, the student will complete the course with a solid understanding of the integrated struggle, and the melitudius utilisation of pesticides from a sustainable development nesconctibe. | 1 | Undergraduate | Phytologie | 1,1,1 | 2, 2, 1, 1 | 1, 1 | 1, 1, 1 | Awareness |
| PLG | 3206 | Plantes fourragères | Grasses and legumes for hay and pasture. Species, cultivars and mixtures. Implementation, management and maintenance of meadows and pastures. Silage. Mowing. Sustainable crop management. | 2 | Undergraduate | Phytologie | 2, 2, 1 | 1, 1, 0, 2 | 0, 2 | 2, 0, 0 | Awareness |
| POL | 2207 | Politiques environnementales | The objective of the course is to introduce the student to environmental issues from the perspective of policy analysis and public administration. The evolution of ecological thinking. The emergence of the main environmental issues and problems in contemporary spicities. | 1 | | Science politique | 3, 3, 3 | 2, 2, 2, 1 | 1, 3 | 1, 1, 1 | Introductory |
| POL | 2507 | Théorie cont. justice sociale | Examination of the main contemporary political and moral theories of social justice utilitarianism, egilitarian liberalism, libertarianism, manxism, communitarianism, feminism and republicanism. Some themses can be tackled such as distributive justice, justice and democracy, international justice and intergenerational justice (especially in the context of sustainable development). | 1 | Undergraduate | Science politique | 2, 2, 2 | 2, 2, 2, 2 | 2, 2 | 2, 2, 2 | Awareness |
| PSY | 1010 | Aspects env. et comm. en psy. | This course focuses on aspects of the physical and social environment that influence human development and behavior, mental health and quality of life. It alms to explain by what mechanisms these influences are exerted and by what means It is possible to intervene to counteract the effects of "toxic" environments and promote healthy living conditions. | 1 | Undergraduate | Psychologie | 1, 1, 1 | 1, 1, 0, 0 | 0, 0 | 0, 1, 0 | Awareness |



| Cou | ırse | Name | Description | # of | Level | Department | Systems | 4 Key Com Anticipatory | | Strategic | Integration into |
|-----|------|--|---|------------|---------------|--------------------------------|---------------------|---------------------------|------|-----------|--------------------------|
| SAN | 1001 | Anatomie, physiologie animales | This course aims to provide basic training in animal anatomy and physiology to all students in the agronomy program. It mainly aims to study the characteristics of the anatomical devices (schelatal system, muscular, etc.) of the farm animals and the understanding of their functioning. Students obtain a solid understanding of animal physiology from a sustainable development perspective. | Sections 1 | Undergraduate | Sciences animales | Thinking 1, 0, 1 | 1, 0, 0, 0 | 0, 0 | 0, 1, 0 | Sustainability Awareness |
| SAN | 1002 | Principes fondament. sc. anim. | This introductory course on animal production focuses on the basic concepts needed to understand farming activities in the following areas: anatomy and physiology, nutrition and nutrition, genetics, hygiene and health, Food security and animal welfare. Students obtain a solid understanding of animal physiology from a sustainable development perspective. | 2 | Undergraduate | Sciences animales | 1, 1, 1 | 2, 1, 0, 1 | 1, 1 | 1, 0, 0 | Awareness |
| SAN | 1003 | Productions animales durables | Introduction to livestock farming in a sustainable development context. Definition of sustainable development and its technical, economic, environmental and social aspects, including animal welfare, as they apply to livestock production and products. | 1 | Undergraduate | Sciences animales | 3, 2, 2 | 3, 1, 2, 3 | 1, 2 | 1, 2, 1 | Introductory |
| SAN | 2201 | Comportement, bien-être animal | Study of basic and applied concepts of farm animal behavior with emphasis on animal welfare. The aim of this course is to familiarize students with farm animal behavior, raise awareness of animal welfare and ethics, and reinforce their critical thinking about modern farming practices, and breeding, in a sustainable development perspective. | 1 | Undergraduate | Sciences animales | 2, 2, 2 | 2, 2, 1, 2 | 1, 2 | 1, 1, 1 | Advanced |
| SAN | 2301 | Product. animales biologiques | This course focuses on the principles and practices of organic production of the main livestock species. It deals with certification standards and challenges in organic farmling. Producers have the means to preserve the welfare and health of their animals, as well as the specificities of the different types of production. | 1 | Undergraduate | Sciences animales | 2, 2, 2 | 2, 2, 1, 2 | 2, 1 | 2, 1, 1 | Advanced |
| SAN | 3102 | Gest. technécon. entr. lait. | Designed according to the problem-based approach, this course aims to transmit knowledge about the economic impact associated with the main technical parameters of Quebec bovine farms. Team problem solving allows students to develop their ability to evaluate the economic value of projects on cattle farms and to develop an approach specific to agronomic practice. Thus, students gain knowledge about agronomic regarding the challenges of technical and economic management from a sustainable development perspective. | 1 | Undergraduate | Sciences animales | 3, 3, 3 | 2, 3, 3, 3 | 1, 3 | 3, 3, 3 | Advanced |
| SAN | 3202 | Production laitière | This course aims to develop a better understanding of dairy production through the diagnosis of problems encountered in Ouebee herds. Topics covered sources of information Dairy industry; Profitability, genetic improvement strategy; Feeding programs; Diagnosis of comfort, udder health and milk quality, the sustainability in dairy production. | 2 | Undergraduate | Sciences animales | 1, 2, 2 | 1, 3, 1, 3 | 1, 2 | 3, 2, 3 | Awareness |
| SAN | 3204 | Production porcine | Integration of the principles of nutrition, physiology, genetics and technico-economic management in order to optimize pig production while appealing to the critical sense, judgment and observation of the student. Notions of preventive medicine and protection of the environment. | 1 | Undergraduate | Sciences animales | 1, 1, 1 | 1, 1, 1, 1 | 1, 1 | 1, 1, 1 | Introductory |
| GBO | 1040 | Matériau bois: transf., util. | Anisotropic wood structure: Macroscopic determination: Properties of wood (typoscopicity) density, mechanical properties, natural durability, thermal properties, energy properties, natural durability, thermal properties, energy properties). Relationships between the structure of wood and its physicomechanical properties. Wood products: Primary and secondary processing processes: The quality of wood versus striculture: Wood and the environment (wood and action cycle, wood recycling, environmental certification of wood, wood and scoot-briffening. | 1 | Undergraduate | Sciences du bois | 2, 2, 2 | 2, 2, 1, 2 | 0, 2 | 1, 0, 0 | Introductory |
| SIN | 7013 | Famille et pratique infirmière avancée | Analysis of a family care approach as an approach in the paradigm of simultaneity and the phenomenological, critical, spiritual and socio-environmental hermeneutic perspectives underlying this approach. This course helps the student gain interpersonal completencies from the integrated approach to patient care, from a sustainable health perspective. | 1 | Graduate | Sciences infirmières | 2, 2, 2 | 1, 1, 0, 1 | 1, 1 | 1, 1, 1 | Introductory |
| SIO | 1000 | Systèmes & technol. inform. | The overall objective of this course is to enable managers to participate actively in the use, management and evolution of their organization's information systems. The course also presents the technological, social and environmental challenges facing organizations in the new digital society, as well as the many opportunities offered by information systems and technologies. | 3 | Undergraduate | Système information organisat. | 2, 1, 1 | 2, 1, 0, 2 | 1, 1 | 1, 1, 2 | Awareness |
| SIO | 6009 | Système d'information | The general objective of this course is to prepare organization managers for the introduction of computerized information systems in their sections of activity, to give them the essential tools to contribute to their development and to control them through the contribution of appropriate reference frameworks. This allows students to improve their efficiency and logistic competencies from a sustainable development one respective. | 3 | Graduate | Système information organisat. | 1, 0, 1 | 1, 1, 0, 1 | 1, 1 | 0, 0, 0 | Awareness |
| SLS | 4000 | Sc. environnementales du sol | Concepts of environment, pollution and sustainable soil management. State of the agricultural and urban environment. Environmental elements of agricultural, forest, urban and | 1 | Undergraduate | Sols | 2, 2, 2 | 3, 3, 2, 1 | 1, 2 | 1, 1, 0 | Advanced |
| SOC | 1100 | Stratification classe sociale | Industrial soils. Ecolopical functions of soils. The subject of the course is the study of the theoretical approaches and the current configurations of classes and inequalities: Bourdieu's cultural approach (inrafamilial socialization, lifestyles); The relation between classes and power; Social mobility: Powerty, social marginalization. | 1 | Undergraduate | Sociologie | 2, 2, 1 | 1, 0, 2, 1 | 0, 2 | 0, 1, 1 | Advanced |
| SOC | 2114 | Environnement et société | This course focuses on the multiple sociopolitical and cultural implications of environmental issues and aims to stimulate a constructive and critical reflection on the place that the environment occupies within our societies. The course covers the following subjects sociology and environment sustainable development: climatic changes; Blodiversity; water; Forests; Urban settings; Participation and environmental governance; Ecological movement; Science, technology and the environment. | 2 | Undergraduate | Sociologie | 3, 3, 3 | 3, 2, 3, 2 | 1, 3 | 2, 3, 3 | Advanced |
| SOC | 2120 | Sociologie innovation technol. | This course presents the current challenges of technological innovation and provides the knowledge needed to understand the multiple facets, applications and impacts. The following topics are discussed: sociology, science and technology; History of techniques; Innovation models: The role of enterprises and the State in technological innovation. Risks and impacts of new technologics: Environment and technological innovation: Ethics and technologics: Environment and technological innovation: | 2 | Undergraduate | Sociologie | 3, 3, 3 | 3, 3, 3, 1 | 1,1 | 1, 1, 0 | Introductory |



| | | | | | | | 4 Key Competencies | | | | | |
|---|---------------------------|-------------------------------|--|----------|---------------|-------------------------------|--------------------|--------------|-----------|-----------|------------------|--|
| | Course | Name | Description | # of | Level | Department | Systems | Anticipatory | Normative | Strategic | Integration into | |
| L | | | | Sections | | | Thinking | | | | Sustainability | |
| 9 | STA 2012 | 2 Aliments et conservation | Processing techniques used in the food industry: Pasteurization, sterilization, refrigeration and freezing as food preservation processes, sustainable development perspective on nutrition and food conservation. | 1 | Undergraduate | Science, technologie aliments | 3, 3, 1 | 2, 0, 0, 2 | 0, 1 | 2, 1, 1 | Awareness | |
| S | TC 3900 | Impact des sc. & technologies | This course examines the applications of science and technology in the industrial world and in everyday life. Concrete examples serve to lifustate, in an integrated way, the technological applications of biology, chemistry and physics. Topics covered: industrial processes (water filtration plant, sating nor faming basin, use of science in modern medicine or in energy production, oil refinery, etc.), modern problems (greenhouse effect, thinning ozone layer, genetic enjonering, waste recycling, alternative sources of energy, sustainable development, food challenges of today and tomorrow, drinking water management). | 1 | Undergraduate | Sciences, techniques civils. | 1, 0, 0 | 1,1,1,1 | 0,1 | 0, 0, 0 | Awareness | |
| _ | Total Course Sections 383 | | | | | | | | | | | |