

Faculty

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ANGELA KROSS, PhD *McGill University*

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SHAUNA JANSSEN, PhD *Concordia University*

AMY LUERS, PhD *Stanford University*

JULIE PODMORE, PhD *McGill University*

AMY TWIGGE MOLECEY, PhD *INRS*

For the complete list of faculty members, please consult the Department website.

Location

Sir George Williams Campus

Hall Building, Room: H 1255-26

514-848-2424, ext. 2050

Department Objectives

The Department of Geography, Planning and Environment focuses on the processes and practices of human intervention in the natural, cultural, and built environment. Human interventions are examined as cultural and political processes across the spectrum of biophysical settings and human settlements. The Department's aim is to provide a systematic understanding of biogeophysical environmental processes and human-environment interactions as a step towards improving policies, practices, and specific

interventions. The curriculum reflects a balance among theoretical, technical, and applied aspects, and promotes environmental and spatial awareness and literacy. The Department aims to train professional geographers, environmental scientists, and urban planners, as well as to produce articulate and informed graduates who are committed to improving the quality and sustainability of the natural, human, and built environment.

Programs

The Department offers honours, specialization, and major programs leading to a BA in the Human Environment, a BA in Urban Planning or Urban Studies, and a BSc in Environmental Science or Environmental Geography. In addition, it offers minor and certificate programs in Geospatial Technologies, and minors in the Human Environment, in Environmental Geography and in Urban Studies. Students wishing to follow a BSc must meet the entry profile for that program (see §31.002 — Programs and Admission Requirements — Profiles).

It is strongly recommended that students planning graduate studies follow the appropriate honours or specialization program. In addition to meeting the Faculty requirements (see §31.003 Honours Programs, Honours Regulations), the Department requires a statement of intent for students seeking admission to the honours program which specifies the proposed topic and supervisor for the Honours Essay (GEOG 491 or URBS 491).

Students are responsible for satisfying their particular degree requirements.

The superscript indicates credit value.

60 BA Honours in the Human Environment

Stage I

- 15 GEOG 220³, 260³, 272³, 274³, 290³
- 3 Chosen from GEOG 210³; GEOL 210³; URBS 230³

Stage II

- 12 GEOG 315³, 361³, 362³, 363³
- 12 Chosen from two groups of electives (with at least three credits from each group)
Group 1: GEOG 310³, 321³, 323³, 330³, 355³, 380³
Group 2: GEOG 371³, 374³, 375³, 377³, 378³

Stage III

- 12 Elective credits in Geography at the 400 level
- 6 GEOG 491⁶

60 BA Specialization in the Human Environment

Stage I

- 15 GEOG 220³, 260³, 272³, 274³, 290³
- 3 Chosen from GEOG 210³; GEOL 210³; URBS 230³

Stage II

- 12 GEOG 315³, 361³, 362³, 363³
- 12 Chosen from two groups of electives (with at least three credits from each group)
Group 1: GEOG 310³, 321³, 323³, 330³, 355³, 380³
Group 2: GEOG 371³, 374³, 375³, 377³, 378³

Stage III

- 12 Elective credits in Geography at the 400 level
- 6 Elective credits in Geography at the 300 or 400 level

42 BA Major in the Human Environment

Stage I

- 15 GEOG 220³, 260³, 272³, 274³, 290³
- 3 Chosen from GEOG 210³; GEOL 210³; URBS 230³

Stage II

- 12 GEOG 315³, 361³, 362³, 363³
- 3 Chosen from GEOG 310³, 321³, 323³, 330³, 355³, 380³
- 3 Chosen from GEOG 371³, 374³, 375³, 377³, 378³

Stage III

- 6 Elective credits in Geography at the 400 level

69 BSc Honours in Environmental Science

Stage I

- 9 BIOL 225³, 226³; GEOG 290³
- 3 COMP 218³ or 248^{3.5}
- 6 Chosen from GEOG 272³, 274³; GEOL 210³
- 3 GEOG 260³ or GEOL 216³
- 3 CHEM 212³ or 217³

Stage II

- 6 BIOL 322³; GEOG 363³
- 3 Chosen from BIOL 321³; GEOG 355³; GEOL 302³

- 9 Chosen from GEOG 371³, 374³, 375³, 377³, 378³
- 6 Chosen from BIOL 350³, 351³, 353³, 367³, 385³; CHEM 271³; CIVI 361^{3,5*}; GEOL 331³; ENGR 251³
- Stage III
- 3 GEOG 463³ or 465³
- 12 Chosen from BIOL 459³; CHEM 375³, 470³, 472³; GEOG 458³, 466³, 467³, 470³, 474³, 475³, 478³, 498^{3**}; GEOL 415³, 440³; CIVI 467³, 468³, 469^{3,5}, 495^{3**}
- 6 Chosen from BIOL 490⁶; GEOG 491⁶; GEOL 414⁶

**Environmental Science students missing the prerequisites may apply to have all or some of these waived by the Department of Building, Civil and Environmental Engineering.*

***Where the subject matter is of an environmental science nature.*

69 BSc Specialization in Environmental Science

Stage I

- 9 BIOL 225³, 226³; GEOG 290³
- 3 COMP 218³ or 248^{3,5}
- 6 Chosen from GEOG 272³, 274³; GEOL 210³
- 3 GEOG 260³ or GEOL 216³
- 3 CHEM 212³ or 217³

Stage II

- 6 BIOL 322³; GEOG 363³
- 3 Chosen from BIOL 321³; GEOG 355³; GEOL 302³
- 9 Chosen from GEOG 371³, 374³, 375³, 377³, 378³
- 6 Chosen from BIOL 350³, 351³, 353³, 367³, 385³; CHEM 271³; CIVI 361^{3,5*}; GEOL 331³; ENGR 251³

Stage III

- 3 GEOG 463³ or 465³
- 18 Chosen from BIOL 459³; CHEM 375³, 470³, 472³; GEOG 458³, 466³, 467³, 470³, 474³, 475³, 478³, 498^{3**}; GEOL 415³, 440³; CIVI 467³, 468³, 469^{3,5}, 495^{3**}

**Environmental Science students missing the prerequisites may apply to have all or some of these waived by the Department of Building, Civil and Environmental Engineering.*

***Where the subject matter is of an environmental science nature.*

45 BSc Major in Environmental Geography

Stage I

- 15 GEOG 220³, 260³, 272³, 274³, 290³
- 3 GEOL 210³
- 3 Chosen from BIOL 225³, 226³, 227³

Stages II & III

- 9 GEOG 361³, 362³, 363³
- 15 300- or 400-level credits chosen from the BSc Geography/Geology course list or in consultation with the appropriate departmental advisor. At least three credits must be at the 400 level.

30 Minor in the Human Environment

- 15 GEOG 220³, 260³, 272³, 274³, 290³
- 3 GEOG 315³
- 12 GEOG elective credits at the 300 or 400 level

NOTE: This minor is intended for Arts students.

24 Minor in Environmental Geography

- 6 Chosen from GEOG 272³, 274³; GEOL 210³
- 3 GEOG 290³
- 9 Chosen from GEOG 363³, 371³, 374³, 375³, 377³, 378³; GEOL 302³, 331³
- 6 Chosen from GEOG 458³, 463³, 466³, 470³, 474³, 475³, 478³; GEOL 415³, 440³

NOTE: This minor is intended for Science students.

24 Minor in Geospatial Technologies

- 3 Chosen from GEOG 210³, 220³, 310³, 330³; URBS 230³
- 6 GEOG 260^{3*}, 466³
- 6 GEOG 264³, 363³ or URBS 335^{3**}
- 9 Chosen from GEOG 463³, 464³, 465³; URBS 434³

** For students who have already completed GEOG 260 as a requirement for their BA or BSc program, this course is replaced with URBS 434.*

***For students who have already completed GEOG 363 or URBS 335 as a requirement for their BA or BSc program, this course is replaced with any 300- or 400-level GEOG or URBS course.*

30 Certificate in Geospatial Technologies

- 3 Chosen from GEOG 210³, 220³; URBS 230³
- 6 GEOG 260³, 466³
- 9 GEOG 264³, 362³, 363³
- 12 GEOG 463³, 464³, 465³; URBS 434³

Students in programs leading to the BSc degree may take the courses in Geography/Geology listed below for credits to be applied to their program of concentration.

GEOG 260	Mapping the Environment (3 credits)
GEOG 264	Programming for Environmental Sciences (3 credits)
GEOG 272	The Natural Environment: Air and Water (3 credits)
GEOG 274	The Natural Environment: Land and Life (3 credits)
GEOG 361	Research Design and Qualitative Methods (3 credits)
GEOG 362	Statistical Methods (3 credits)
GEOG 363	Geographic Information Systems (3 credits)
GEOG 371	Landscape Ecology (3 credits)
GEOG 374	Plant Ecology (3 credits)
GEOG 375	Hydrology (3 credits)
GEOG 377	Landform Evolution (3 credits)
GEOG 378	The Climate System (3 credits)
GEOG 458	Environmental Impact Assessment (3 credits)
GEOG 463	Advanced Geographic Information Systems (3 credits)
GEOG 464	Programming for Geospatial Technologies (3 credits)
GEOG 465	Remote Sensing (3 credits)
GEOG 466	Geomedia and the Geoweb (3 credits)
GEOG 470	Environmental Management (3 credits)
GEOG 473	Environment and Health (3 credits)
GEOG 474	Sustainable Forest Management (3 credits)
GEOG 475	Water Resource Management (3 credits)
GEOG 478	Climate Change: Science, Impacts and Policy (3 credits)
GEOL 210	Introduction to the Earth (3 credits)
GEOL 216	Field Methods (3 credits)
GEOL 302	Palaeobiology (3 credits)
GEOL 331	Evolution of the Earth (3 credits)
GEOL 415	Plate Tectonics and Crustal Evolution (3 credits)
GEOL 440	Seminar in Current Research on Environmental Earth Science (3 credits)

Courses

Geography

GEOG 200 *World Geography* (3 credits)

This course provides an overview of world geography. It first examines the main environmental and social factors that geographers have employed to divide the world into a series of distinctive regions, and uses examples of specific countries to explore the distinctive geographical processes by which these patterns are transformed and perpetuated.

NOTE: Students currently registered in a Human Environment, Environmental Geography, or Environmental Science program may not take this course for credit.

GEOG 203 *Canadian Environmental Issues* (3 credits)

This course examines the diversity and complexity of Canadian environmental issues from an interdisciplinary perspective. Natural science considerations are explored as well as the relationship of scientific understanding to policy and wider social action. Issues addressed include fisheries, animal rights, biodiversity conservation, protected areas, energy, and climate change.

NOTE: Students currently registered in a Human Environment, Environmental Geography, or Environmental Science program may not take this course for credit.

GEOG 204 *Global Environmental Issues* (3 credits)

This course examines a number of global environmental issues from an interdisciplinary perspective. The complex interactions and interdependencies among the biophysical, socio-economic, political, and cultural aspects of global environmental change are explored in relation to issues such as global warming, desertification, deforestation, declining biodiversity, and acid rain.

NOTE: Students currently registered in a Human Environment, Environmental Geography, or Environmental Science program may not take this course for credit.

GEOG 206 *Maps and Mapping* (3 credits)

This course explores the role of maps in society. Students are introduced to basic mapping concepts in order to evaluate the meaning and use of various types of maps. Samples of the following types of maps are studied: historic maps, political maps, cognitive maps, maps in newspapers and magazines, computer-generated maps, and maps on television.

NOTE: Students who have completed courses numbered GEOG 209 and above may not take GEOG 200-208 for credit.

GEOG 209 *The Geography of a Selected Region* (3 credits)

The course includes both a systematic survey as well as an in-depth focus on particular geographical issues and problems. The specific region to be studied may vary from year to year.

GEOG 210 *Geography of Global Change* (3 credits)

This course examines a variety of geographical changes related to globalization. It focuses mainly on the global political system and the global economy, and also considers transport and communications systems, culture, and environmental issues.

GEOG 220 *Place, Space, and Identity* (3 credits)

This course examines how place is constructed through subjective encounters of humans with each other and with the non-human world. This focus reveals how the unique and contested identities of places are created and how space itself is socially constructed. The ways in which place, space and identity affect and are affected by political, economic, cultural and environmental changes are then examined within the context of existing patterns of geographical unevenness.

GEOG 260 *Mapping the Environment* (3 credits)

This course introduces students to the basic concepts, theory, and methods of mapping with reference to topographic and thematic maps. Through lectures, laboratories, and practical assignments, students learn about the sources of data for maps, and how these data are manipulated, represented, and interpreted in both analog and digital form (Geographic Information Systems). Lectures and laboratory.

GEOG 264 *Programming for Environmental Sciences* (3 credits)

This course is an introduction to the fundamentals of computer programming relevant for environmental sciences. It presents the basic building blocks of computer programming, including data types, variables and constants; expressions and operators; assignments, control structures, simple library functions and programmer-defined functions. Students learn how to develop algorithms and how to convert algorithms/pseudo codes into a programming language — specific syntax (e.g. R, Python) — to collect, query, preprocess, visualize and analyze environmental datasets. Lectures and laboratory.

NOTE: Students who have received credit for STAT 280 or for this topic under a GEOG 298 number may not take this course for credit.

GEOG 272 *The Natural Environment: Air and Water* (3 credits)

This course introduces the Earth's atmosphere and hydrosphere through an examination of their structural components, processes, and variability through space and time. Topics include the global energy system, air temperature cycles, weather systems, urban climate, the water cycle, oceans, lakes, and rivers.

GEOG 274 *The Natural Environment: Land and Life* (3 credits)

This course introduces the Earth's lithosphere and biosphere through an examination of their structural components, processes, and variability through space and time. Topics include the tectonic system, volcanic activity, landscape and landform development, soils, biogeochemical cycling, succession, and biomes.

GEOG 290 *Environment and Society* (3 credits)

Prerequisite: Enrolment in a BA Human Environment or BSc Environmental Geography or BSc Environmental Science program, or permission of the Department. Relations between the environment and society both preserve and threaten the more-than-human world. Drawing on vibrant contributions from geographical and interdisciplinary fields, this course introduces concepts and frameworks for clarifying and interrogating existing environment-society relations and for imagining possible alternatives. Topics may include nature/culture divide, alternative ideas of nature, historical dimensions of current environment-society relations, the role of experts and expertise in contemporary society, the impact of unequal distributions of political power on people and the environment, and possibilities for hope in troubled times. Writing tutorials linked to the course assignments help students learn university-level academic writing and critical thinking skills. Lectures and tutorials.

GEOG 298 *Selected Topics in Geography* (3 credits)

GEOG 299 *Selected Topics in Geography* (6 credits)

Specific topics for these courses, and prerequisites relevant in each case, are stated in the Undergraduate Class Schedule and the Geography Course Guide.

GEOG 301 *The Sustainable University Campus* (3 credits)

Prerequisite: 30 university credits or permission of the Department. With the campus as the laboratory, this course explores and contributes to building a more sustainable campus community. It is designed to support Concordia's commitment to sustainability while providing students with an applied learning experience. Students gain experience in planning and implementing interdisciplinary research projects using a variety of qualitative and quantitative techniques. They learn about participatory action research, the application of sustainability concepts in a living and learning organization, and work in teams to develop creative and actionable projects that contribute to moving the University in a more sustainable direction. The course integrates theory and practice. The Concordia Campus Sustainability Assessment as well as recent literature and case studies from the sustainability assessment and reporting fields form the theoretical foundations of the course. The course uses lectures, guest speakers, workshops, and project work as learning tools.

NOTE: Students who have received credit for this topic under a GEOG 398 number may not take this course for credit.

GEOG 310 *Refugees and Migration in Today's World* (3 credits)

Prerequisite: GEOG 220; or completion of 30 credits for students enrolled in a Social Science program; or permission of the Department. This course examines key issues in human displacement through refugee movements and migrations. Geographies of displacement centre around questions of human rights, nation-state and the politics of belonging, as well as exile/home. While

displacement is often framed as a political or humanitarian crisis, it also raises important issues regarding citizenship and exclusion, shelter and sanctuary, movement and confinement. This course offers geographic approaches to understanding how people experience displacement, as well as how displacement is managed at a policy level and/or represented in discourse.

GEOG 315 Social and Cultural Geographies (3 credits)

Prerequisite: GEOG 220, 290. The field of social and cultural geography explores how social difference (e.g. race, gender, sexuality, class, disability, migrant status) and cultural representations (e.g. ideas of heritage, consumerism, colonialism, arts, aesthetics, or home) interact with space and place. This course examines processes such as the legitimation of social structures and experience, struggles over identity and memory, contestations of cultural meaning, and resistance to power. This is a field that asks — how does geography help imagine an alternative future?

NOTE: Students who have received credit for GEOG 300 may not take this course for credit.

GEOG 321 A World of Food (3 credits)

Prerequisite: 24 university credits. This course examines the geographical processes that have affected the production and consumption of food from the beginnings of agriculture to the rise of genetically modified organisms, and considers the part played by different patterns of diet and cuisine in shaping distinctive regions at the global and local scale.

NOTE: Students who have received credit for this topic under a GEOG 398 number may not take this course for credit.

**GEOG 323 (also listed as URBS 337)
Urban Agriculture** (3 credits)

Prerequisite: GEOG 220 or URBS 230 or permission of the Department. This course examines the history and practice of producing food in cities. Students will explore the tensions between the politics, economics and ecologies that organize urban food production and the everyday ways people raise and access food in varied urban contexts. The course also critically evaluates food-based social movements: their limits, possibilities and connections to wider struggles for socio-economic justice.

NOTE: Students who have received credit for URBS 337 or for this topic under a GEOG 398 or URBS 398 number may not take this course for credit.

GEOG 330 Urban Geography (3 credits)

Prerequisite: GEOG 220 or permission of the Department. The geographer's view of the city is explored at two scales: cities as elements of an urban system, including topics such as urbanization and the functional structure of cities; and intra-urban patterns, including the spatial arrangement of land-use and social areas.

**GEOG 333 (also listed as URBS 310)
Urban Transportation** (3 credits)

Prerequisite: GEOG 220 or URBS 230 or permission of the Department. This course examines the past evolution and recent functioning of various transport modes in cities around the world. Recent debates about desirable levels of car, transit, and non-motorized modes feature prominently. Techniques of analyzing urban transport and public policy options are considered in light of burgeoning concerns about sustainable development and the worldwide growth of motorization.

NOTE: Students who have received credit for URBS 310 may not take this course for credit.

GEOG 342 The Making of the Irish Landscape (3 credits)

Prerequisite: Second-year standing or permission of the Department. This course focuses on the evolution of the Irish landscape and examines the physical, political, social, economic and attitudinal processes that have shaped the cultural landscape from prehistoric times to the present.

NOTE: Students who have received credit for this topic under a GEOG 398 number may not take this course for credit.

GEOG 355 Resource Analysis and Management (3 credits)

Prerequisite: GEOG 290 or permission of the Department. The course is concerned with the use of the Earth's natural resources and with the economic, institutional, and ecological factors that affect, condition, and control the use of these resources. It examines various approaches to analyzing, evaluating, and resolving resource issues and conflicts. These approaches are applied to Canadian forestry, fisheries, water, energy, and mineral resources.

GEOG 361 Research Design and Qualitative Methods (3 credits)

Prerequisite: GEOG 260 or permission of the Department. This course introduces students to commonly employed methods and techniques for undertaking social science research. After reviewing the philosophical considerations underlying particular research traditions and the merits and limitations of distinct types of research strategies, the course examines specific sets of methods and the kinds of questions and research topics for which they are best suited. The focus is on qualitative methods but also examines the complementarity of qualitative and quantitative techniques and the broader research designs in which quantitative techniques can be employed. Readings are supplemented with in-class and field exercises. Occasional involvement in fieldwork outside of class time is required.

NOTE: Students who have received credit for GEOG 360 may not take this course for credit.

GEOG 362 Statistical Methods (3 credits)

Prerequisite: GEOG 361 or permission of the Department. This course introduces statistical methods for geographers. Topics include sampling, data manipulation, probability distributions, statistical inference, hypothesis testing, correlation and regression. Lectures and laboratory.

NOTE: Students who have received credit for BIOL 322, COMM 215, ECON 221, GEOG 360, INTE 296, MAST 221 or 333, PSYC 315, SOCI 213 or STAT 249 may not take this course for credit.

GEOG 363 (also listed as URBS 335)

Geographic Information Systems (3 credits)

Prerequisite: GEOG 260 or permission of the Department. This course is an introduction to current theoretical and practical approaches to Geographic Information Systems (GIS) through which students acquire basic skills and understanding in the use of GIS for spatial analysis. Training is centred on a series of practical assignments using ArcGIS software and for the term project, students explore the potential of GIS for addressing a real-world problem. Lectures and laboratory.

NOTE: Students who have received credit for URBS 335, 387, or 487 may not take this course for credit.

GEOG 371 Landscape Ecology (3 credits)

Prerequisite: GEOG 272, 274. The objective of this course is to combine perspectives and principles originating in ecology and geography for application in conservation, restoration, and more sustainable land use. Students examine how natural processes and human activities interact and contribute to landscape change, and how landscape patterns influence the abundance and distribution of plants and animals. Topics include natural processes such as fire, water, and the movement of organisms; human activities such as transportation infrastructure and urban development; and methods for analyzing landscape structure such as patches, corridor networks, and landscape metrics. Lectures and laboratory.

GEOG 374 Plant Ecology (3 credits)

Prerequisite: GEOG 272 and 274. This course examines plant community dynamics as a consequence of the population dynamics of the constituent plant species. The role of natural disturbances is stressed, particularly as it relates to forests. Concepts are applied to problems in park management, vegetation mapping, and present controversies about the maintenance of species diversity. Lectures and laboratory with a mandatory one-day field trip.

NOTE: Students who have received credit for GEOG 372 or 373 may not take this course for credit.

GEOG 375 Hydrology (3 credits)

Prerequisite: GEOG 272, 274; or permission of the Department. The course examines the hydrologic cycle, with a main focus on surface hydrology. Topics covered include the organization of the river network, precipitation over a watershed, runoff, flood frequency analysis, estimation of peak streamflows, flow, and sediment transport in rivers. Assignments provide experience in the practical aspects of hydrological data treatment using Canadian examples. The course aims at understanding the mechanics of processes governing the motion of water on hillslopes and in rivers, which are essential to water management. Lectures and tutorial.

GEOG 377 Landform Evolution (3 credits)

Prerequisite: GEOG 272; GEOG 274 or GEOL 210; or permission of the Department. This course examines the processes responsible for the development and evolution of the Earth's landforms, including human modifications to those landforms. Topics include the study of fluvial, coastal, glacial, periglacial, and arid landforms. Lectures and laboratory.

NOTE: Students are strongly encouraged to take GEOL 210.

GEOG 378 The Climate System (3 credits)

Prerequisite: GEOG 272; GEOG 274 or GEOL 210; or permission of the Department. This course examines the interacting components of the climate system (atmosphere, ocean, ice, land and vegetation) and the key features of the present-day weather and climate systems; including a focus on how the climate system has changed in the past, and the processes, both natural and human-induced, which drive and moderate these changes. Methods used to reconstruct past climate changes, and the use of climate models to understand climate system interactions and change are discussed. Lectures and laboratory.

GEOG 380 Ecological Economics (3 credits)

Prerequisite: GEOG 210 or GEOG 290; or ECON 201, 203. This course provides an introduction to economic perspectives on environmental issues. It is designed to study the interplay between the economic sphere and the environment by addressing questions of economic life, such as activities of corporations and states, role of markets, energy and resource use, growth and development, population, food, international trade and financial systems. These questions are explored through alternative economic approaches, among which the tradition of ecological economics is the centrepiece.

GEOG 398 Selected Topics in Geography (3 credits)

GEOG 399 Selected Topics in Geography (6 credits)

Specific topics for these courses, and prerequisites relevant in each case, are stated in the Undergraduate Class Schedule and Geography Course Guide.

GEOG 406 Tropical Forests (3 credits)

Prerequisite: GEOG 374 or permission of the Department. This course focuses on three themes: how tropical forest ecosystems function and change; the causes and consequences of deforestation and faunal impoverishment; and the ecological and sociological problems faced by conservationists in the tropics.

GEOG 407 Indigenous Peoples and the Environment (3 credits)

Prerequisite: GEOG 315 or permission of the Department. This course provides an extended, in-depth exploration of the relationships and roles of Indigenous peoples with respect to their traditional territories and natural resources. Indigenous ontologies and epistemologies are highlighted in addition to Indigenous aspirations and approaches for use and stewardship of the environment. The course examines theoretical and case-study literature, with a broad regional focus on Aboriginal peoples in Canada while also drawing from comparative international experiences of Indigenous peoples.

GEOG 418 Geographies of Postcolonialism (3 credits)

Prerequisite: GEOG 315 or permission of the Department. Based largely on scholarship about the Americas, this course introduces students to theories of the colonial present and traces geographies of a variety of contemporary colonial processes and anti-colonial struggles.

NOTE: Students who have received credit for this topic under a GEOG 498 number may not take this course for credit.

**GEOG 430 (also listed as URBS 420)
Social Geographies of Montreal** (3 credits)

Prerequisite: GEOG 315 or 330; or permission of the Department. This course explores the social and cultural geographies of Montreal with particular emphasis on how the spatial distribution of communities influences urban planning and public policy at the local and regional levels. Complex webs of identities and solidarities informed by socio-economic, linguistic, ethno-cultural, and sexual orientation factors shape the city living experience of individuals and populations alike. Through lectures, discussions, assignments and field trips, students are introduced to a variety of analytical perspectives that investigate the socio-cultural dynamics that contribute to shaping urban settlements, human-environment interactions and local social networks.

NOTE: Students who have received credit for URBS 420 may not take this course for credit.

**GEOG 431 (also listed as URBS 481)
Urban Planning in the Developing World** (3 credits)

Prerequisite: GEOG 330 or URBS 380 or permission of the Department. This course explores the growth and planning of large metropolitan areas in developing nations. Issues and problems associated with recent urbanization are examined along with potential solutions offered by urban planning and public policies. The planning roles of institutions, including governments, multilateral development agencies, and non-governmental organizations, are reviewed.

NOTE: Students who have received credit for URBS 481 may not take this course for credit.

GEOG 435 Transportation Impact Assessment (3 credits)

Prerequisite: URBS 310 or GEOG 333; URBS 335 or GEOG 363; or permission of the Department. This course introduces students to the quantitative analysis of the environmental (e.g. emissions) and social impacts (e.g. accessibility) of transportation system interventions. Students are introduced to, and gain hands-on experience with, the traditional transportation planning and modelling process aided by the use of a Geographic Information System (GIS)-based transportation decision aid tool. A real-world case-study region and transportation system are used to illustrate the different elements of the planning and modelling process and how this can be used in impact assessment. Lectures and laboratory.

NOTE: Students who have received credit for URBS 435 or for this topic under a GEOG 498 or URBS 498 number may not take this course for credit.

GEOG 440 Geography and Public Policy (3 credits)

Prerequisite: 33 credits in Geography or permission of the Department. This course examines the relationship between geographical approaches to problems and issues, and the public policy process. It discusses such topics as the relevance of geographical information and geographical research to policy makers, the need for assessment of the spatial and environmental impact of public policies, and the role of geographers in the public policy process.

**GEOG 450 (also listed as URBS 450)
Economic Restructuring** (3 credits)

Prerequisite: GEOG 330 or GEOG 380 or URBS 380 or permission of the Department. This course examines the nature of economic restructuring in late capitalism and the implications that industrial restructuring trends are having for the geography of industries, the structure of firms, workplace relations and workers' rights. It examines the new challenges that restructuring presents for both economic development prospects and labour market policies, as well as looking at contemporary initiatives to promote more socially and environmentally sustainable development paths.

NOTE: Students who have received credit for URBS 450 may not take this course for credit.

GEOG 458 Environmental Impact Assessment (3 credits)

Prerequisite: GEOG 355 or permission of the Department. This course examines the conceptual bases, procedures, and methodology of Environmental Impact Assessment (EIA). The effectiveness of EIA as a decision-making process in the promotion of good environmental planning is analyzed, including its role in assessing the potential effects of certain activities on the natural environment as well as on social, cultural, and economic aspects of the environment.

GEOG 463 Advanced Geographic Information Systems (3 credits)

Prerequisite: GEOG 363 or URBS 335; or permission of the Department. This course focuses on database structure and management as well as advanced spatial analysis techniques. It considers both practical and theoretical questions of interpretation of GIS in the context of particular problems and real data sets. The course involves hands-on use of ArcGIS software in a laboratory setting. Lectures and laboratory.

GEOG 464 Programming for Geospatial Technologies (3 credits)

Prerequisite: GEOG 264, 363; or permission of the Department. This course introduces students to the world of programming for geospatial technologies and web mapping. Through a review of the main concepts, techniques, standards, libraries and languages, students learn how to use programming to improve the geospatial data analysis process and to design maps that enhance the user's experience. Training is centred on programming languages for Geographical Information System (GIS) applications (e.g. Python) as well as for web mapping (e.g. HTML, CSS and JavaScript). These languages are used to automate workflows for GIS analysis and customize stylistic and meaningful online maps. Lectures and laboratory.

GEOG 465 Remote Sensing (3 credits)

Prerequisite: GEOG 363 or URBS 335, or permission of the Department. This course provides basic knowledge about the theory and practice of remote sensing, its potential and limits. The course is divided in five parts: 1) fundamentals of remote sensing, where the physical basis of remote sensing is explained; 2) sensors and orbits (different types of sensors, passive, active, and thermal sensors); 3) digital image processing, looking at image enhancement, filtering, classification, and how to obtain thematic data from raw imagery; 4) applications of remote sensing such as forestry, urban studies, water pollution, and agriculture; and 5) problems and challenges associated with remote sensing. Practical examples for all these topics will be covered in the laboratory sessions. Lectures and laboratory.

GEOG 466 Geomedia and the Geoweb (3 credits)

Prerequisite: GEOG 363 or URBS 335; or permission of the Department. This course introduces students to geospatial technologies that have dramatically changed the way one interacts with the environment. Students acquire the geovisualization skills required to design meaningful maps in the context of the Geoweb, and are exposed to the growing body of literature that critically envisions the socio-political dimensions of these new forms of cartographic expression. Lectures and laboratory.

GEOG 467 Environmental Modelling (3 credits)

Prerequisite: GEOG 362 or BIOL 322; enrolment in the BSc Honours Environmental Science or BA Honours Human Environment; permission of the Department. The different approaches to modelling the biophysical, built, or human environment are examined. The conceptualization of simple models to examine how human interventions affect the environment is investigated. Different modelling approaches such as system models, computer visualization and simulation are covered. Students develop a model scheme related to a topic of interest. Lectures and laboratory.

NOTE: Students who have received credit for this topic under a GEOG 498 number may not take this course for credit.

GEOG 470 Environmental Management (3 credits)

Prerequisite: GEOG 375 or 377, or permission of the Department. This course provides students with an understanding and appreciation of the field of environmental management and its contribution to addressing the impacts of human activities on the natural environment. Assessment of the limitations associated with conventional command-and-control approaches to environmental management are considered. The course also focuses on emerging concepts and frameworks associated with a recent rethinking of environmental management approaches, including complex adaptive systems, social-ecological systems, and resilience.

GEOG 473 Environment and Health (3 credits)

Prerequisite: 48 credits completed in the Human Environment, Environmental Geography, or Environmental Science program or permission of the Department. This course examines geographical approaches to the study of health, focusing on the investigation of spatial variations in disease incidence, the ecology of selected diseases, and the links between health and the biophysical, social, and built environment. Focus is placed on critical examinations of approaches and methods of explanation.

GEOG 474 Sustainable Forest Management (3 credits)

Prerequisite: GEOG 374 or permission of the Department. This course looks at changes in the exploitation and sustainable management of the forest resource in Canada and the United States. Topics include the evolution of harvesting strategies and their effect on species composition; the effects of technological changes in cutting, transportation, and milling on forests; and the recent evolution of the tension between environmentalists and foresters. There is a mandatory field trip.

GEOG 475 Water Resource Management (3 credits)

Prerequisite: GEOG 355; GEOG 375 or 377; or permission of the Department. This course examines the complexity of, and necessity for, better water resource management from the viewpoint of ecological and economic sustainability as well as social equity and basic human health and dignity. Topics include the qualities, values, and uses of water — consumptive and non-consumptive, economic and environmental; major regional and global water management issues; factors affecting water supply reliability and challenges to maintain and improve long-term quality and equitable service in different situations; and the ways domestic, industrial, and agricultural water users can conserve water.

NOTE: Students who have received credit for this topic under a GEOG 498 number may not take this course for credit.

GEOG 478 Climate Change: Science, Impacts and Policy (3 credits)

Prerequisite: GEOG 378 or equivalent; or permission of the Department. This course examines the science, impacts and policy options surrounding recent and future global climate change. The first part of the course focuses on the basic science of global warming including the greenhouse effect, climate models, and predictions of future climate change, and an assessment of possible climate impacts. The course concludes with an overview of potential solutions to climate change, including national and international climate policy, energy alternatives, and technological approaches to reducing human impacts on the climate system.

NOTE: Students who have received credit for this topic under a GEOG 498 number may not take this course for credit.

GEOG 485 Feminist Geographies (3 credits)

Prerequisite: GEOG 315 or permission of the Department. This course analyzes gender and socio-spatial relations of power. Specifically, this course engages with feminist thought through its intersections with anti-racist, queer, and emancipatory geographies. This is a discussion-based seminar which includes personal reflection on space, identity and difference, resistance and agency, as well as broader global and historical contexts.

NOTE: Students who have received credit for this topic under a GEOG 498 number may not take this course for credit.

GEOG 490 *Internship in Geography* (3 credits)

Prerequisite: Permission of the Department. Through a case study or practicum of 120 hours with a private or public institution, or community interest group, students acquire experience in a professional working environment.

GEOG 491 *(also listed as URBS 491)*
Honours Essay (6 credits)

Prerequisite: Permission of the Department. The course requires the student to propose and conduct a research project and to produce a substantial report under the supervision of a faculty advisor.

GEOG 495 *Field Research* (3 credits)

Prerequisite: 30 program credits and permission of the Department. This course gives the student the experience of field research in human-environment interactions. The field excursion, often in combination with a local organization, is typically two or three weeks in duration.

GEOG 498 *Advanced Topics in Geography* (3 credits)

GEOG 499 *Advanced Topics in Geography* (6 credits)

Specific topics for these courses, and prerequisites relevant in each case, are stated in the Undergraduate Class Schedule and Geography Course Guide.

Geology

GEOL 203 *Introduction to Environmental Geology* (3 credits)

Prerequisite: GEOL 210 recommended. Environmental geology is concerned with the physical, chemical, and biological processes that have acted, and continue to act, upon the planet, shaping its evolution. The course examines the interactions of lithosphere, mantle, core, biosphere, atmosphere, cryosphere, and hydrosphere. The Earth's climate is in part determined by these Earth system interactions, and climate change throughout the Earth's history is a central theme of the course.

GEOL 204 *Natural Disasters* (3 credits)

This course introduces students to natural disasters. Students gain an understanding of the geological and meteorological environments of the world that allow humans to plan for avoidance and mitigation of disasters. Topics may include plate tectonics, earthquakes, volcanoes, tsunamis, landslides and mudslides, hurricanes, floods, wildfires, ice storms, thunderstorms, and tornadoes. *NOTE: Students who have received credit for this topic under a GEOL 298 number may not take this course for credit.*

GEOL 206 *Earthquakes, Volcanoes, and Plate Tectonics* (3 credits)

This course is for students with little or no previous background in the earth sciences, providing an up-to-date account of our present knowledge of earthquakes and volcanoes, and the use of this information in the development of the theory of plate tectonics. Areas of concentration are: nature, distribution, and causes of earthquakes and volcanic eruptions, measuring earthquakes, great earthquakes and volcanic eruptions in world history, products of volcanic eruptions, and hazards from, and prediction of, earthquakes and volcanic eruptions. The theory of plate tectonics and the evolution of mountain belts of the world are studied. Lectures only.

GEOL 208 *The Earth, Moon and the Planets* (3 credits)

The course emphasizes the cosmic perspective of the Earth and focuses attention on how the results of the last two decades of planetary exploration have brought about an intellectual revolution concerning the planets, especially their surface features, processes, and histories. Lectures only.

GEOL 210 *Introduction to the Earth* (3 credits)

This course provides an overview of the physical processes that govern how the Earth works. Topics include origin of the solar system and Earth; analysis of the internal structure of the Earth; minerals and rocks; igneous and metamorphic processes; deformation of the crust; surficial processes, including weathering, deposition and glaciation. The course culminates with the integration of these geological processes in the theory of plate tectonics, and goes on to examine the interactions of crust, mantle, atmosphere, and biosphere from this perspective. Laboratory work includes the identification of rocks and minerals, map exercises, and a field trip. Lectures and laboratory.

GEOL 216 *Field Methods* (3 credits)

Prerequisite: GEOL 210. The purpose of this course is twofold: to learn the basic methods that geologists, physical geographers, and environmental scientists use in the field (including learning how to map, measuring stratigraphic sections, and solving field problems based on observations) and to become familiar with the immediate geological environment of the Montreal region from the young Quaternary sediments, Mesozoic intrusive rocks and Paleozoic assemblages (including rocks of the St. Lawrence Lowlands) to the ancient Precambrian, crystalline basement. Two-week field school in the spring, immediately after the final examination.

GEOL 298 *Selected Topics in Geology* (3 credits)

Specific topics for this course, and prerequisites relevant in each case, are stated in the Undergraduate Class Schedule and Geography Course Guide.

GEOL 302 Palaeobiology (3 credits)

Prerequisite: GEOL 210. General discussion covers taphonomy, processes and patterns of evolution, extinction, ontogeny, palaeoecology and taxonomy. Systematics, morphology, biostratigraphic value of selected macro-invertebrate fossils will be included in the latter half of the course. Lectures and laboratory.

NOTE: Students who have received credit for GEOL 212 may not take this course for credit.

GEOL 331 Evolution of the Earth (3 credits)

Prerequisite: GEOL 210 or permission of the Department. The geological evolution of planet Earth is studied in the context of the theory of plate tectonics using interpretations of stratigraphic, structural, seismic, paleontologic, and geochronologic data. A systematic review of the geological evolution of the Earth and development of life forms is examined from the time of formation of the Earth to the present, including case studies of mountain belts. In the lab, rock suites and geological maps representative of different periods of Earth history are examined. Lectures and laboratory.

NOTE: Students who have received credit for GEOL 310 may not take this course for credit.

GEOL 398 Selected Topics in Geology (3 credits)

Specific topics for this course, and prerequisites relevant in each case, are stated in the Undergraduate Class Schedule and Geography Course Guide.

GEOL 414 Undergraduate Research (6 credits)

Prerequisite: For third-year honours students. Honours students in their final year are expected to show competence in isolating and examining a geological problem under the supervision of a faculty advisor. A written application to take the course, including a brief outline of the research project, must be made to the Department before April 15 of the second year. The application is reviewed by a committee and a decision forwarded by mail. The results of research must be presented in the form of an undergraduate thesis, two copies of which must be submitted by April 1.

NOTE: Written requests from specialization students, with appropriate academic records, to take the course will be considered.

GEOL 415 Plate Tectonics and Crustal Evolution (3 credits)

Prerequisite: GEOL 210; GEOL 331 or GEOG 377; or permission of the Department. Techniques of data collection in tectonics. Structure and rheology of the upper mantle. Tectonics of crustal types to include shields, platforms, passive continental margins, Phanerozoic foldbelts, continental rifts, island-arc trench belts and oceanic rises, sea-floor spreading, plate tectonics, magma associations, and plate reconstructions. Crustal origin and growth. Lectures and laboratory.

NOTE: Students who have received credit for GEOL 315 may not take this course for credit.

GEOL 440 Seminar in Current Research on Environmental Earth Science (3 credits)

Prerequisite: GEOL 331 or GEOG 377, or 60 credits in an Engineering program, or permission of the Department. This course covers current research in environmental Earth science; topics vary from year to year, but will generally include: mantle-biosphere-atmosphere interactions, the carbon and methane cycles, and the geological climate record. Evaluation is based on seminar participation and written work.

NOTE: Students who have received credit for this topic under a GEOG or GEOL 498 number may not take this course for credit.

GEOL 498 Advanced Topics in Geology (3 credits)

Specific topics for this course, and prerequisites relevant in each case, are stated in the Undergraduate Class Schedule and Geography Course Guide.

31.130.1 URBAN PLANNING AND URBAN STUDIES

The Urban Planning and Urban Studies programs introduce students to past, present, and future processes of urbanization. Three programs (BA Major in Urban Studies, BA Honours in Urban Planning and BA Specialization in Urban Planning) share a common core of courses and offer students theoretical, analytical, and technical knowledge to comprehend complex urban dynamics. The programs prepare students for work in the professional planning, public policy, community development, and real estate fields. The Urban Planning programs are differentiated from Urban Studies by further skills training in the translation of theory into professional practice.

Programs

Students are responsible for satisfying their particular degree requirements.

The superscript indicates credit value.

All course substitutions must be approved by an academic advisor. Students enrolled in the Major in Urban Studies, or other undergraduate programs in Arts and Science, seeking to transfer to the BA Specialization in Urban Planning normally request a transfer at the end of their first year, after completing a minimum of nine URBS credits. A minimum cumulative GPA of 3.0 is required to transfer.

63 BA Honours in Urban Planning

Stage I

12 URBS 230³, 240³, 250³, 260³

Stage II

15 URBS 333⁶, 335³, 362³, 393³

12 Chosen from GEOG 330³; URBS 300³, 310³, 337³, 338³, 380³; and up to 3 credits from ARTH 374³, POLI 349³

- Stage III*
- 12 URBS 433⁶, 491⁶
- 12 Chosen from URBS 420³, 434³, 435³, 450³, 460³, 480³, 481³, 486³, 488³, 490³, 495³; and up to 6 credits from GEOG 463³, 465³, 466³
- 60 BA Specialization in Urban Planning**
- Stage I*
- 12 URBS 230³, 240³, 250³, 260³
- Stage II*
- 15 URBS 333⁶, 335³, 362³, 393³
- 12 Chosen from GEOG 330³; URBS 300³, 310³, 337³, 338³, 380³; and up to 3 credits from ARTH 374³, POLI 349³
- Stage III*
- 6 URBS 433⁶
- 15 Chosen from URBS 420³, 434³, 435³, 450³, 460³, 480³, 481³, 483³, 486³, 488³, 490³, 495³; and up to 6 credits from GEOG 463³, 465³, 466³
- 42 BA Major in Urban Studies**
- Stage I*
- 12 URBS 230³, 240³, 250³, 260³
- Stage II*
- 9 URBS 300³, 335³, 362³
- 12 Chosen from GEOG 330³; URBS 310³, 337³, 338³, 380³, 393³; and up to 3 credits from ARTH 374³, POLI 349³
- Stage III*
- 9 Chosen from URBS 420³, 434³, 435³, 450³, 460³, 480³, 481³, 486³, 488³, 490³, 495³; and up to 3 credits from GEOG 463³, 465³, 466³
- 30 Minor in Urban Studies**
- 6 URBS 230³, 240³
- 18 Chosen from GEOG 220³, 330³; URBS 250³, 260³, 300³, 310³, 337³, 338³, 380³, 393³
- 6 Chosen from URBS 420³, 434³, 435³, 450³, 460³, 480³, 481³, 486³, 488³, 490³

Courses

URBS 230 *Urbanization: Global and Historical Perspectives* (3 credits)

This course examines how and why cities grow and change over time. The relationships between socio-cultural, economic, and physical aspects of urban development are considered at the local, city, and regional scales.

URBS 240 *Planning* (3 credits)

This course examines the emergence and evolution of contemporary planning ideas within the broader historical context of 19th- and 20th-century city development. Special attention is given to how planning theories and practices have informed the development and management of urban, suburban and rural environments.

URBS 250 *Representation Methods in Urban Studies* (3 credits)

This course introduces students to theories and methods of graphic representation. It focuses on methods used to analyze and communicate data with an emphasis on spatial information on built and social environments. The representation methods include two- and three-dimensional views, cartography, as well as data visualization. Physical and digital tools are covered. Lectures and laboratory.

URBS 260 *Analytical Methods in Urban Studies* (3 credits)

This is an introduction to qualitative research skills associated with urban studies. The emphasis is on the use of data sources and collection techniques along with analytical procedures appropriate to questions of urban planning and public policy. Lectures and laboratory.

URBS 298 *Selected Topics in Urban Studies* (3 credits)

Specific topics for this course, and prerequisites relevant in each case, are stated in the Undergraduate Class Schedule and Geography Course Guide.

URBS 300 *Neighbourhood and Community Planning* (3 credits)

Prerequisite: GEOG 220 or URBS 230. This course examines theories, issues, and techniques of community-level planning in urban and suburban environments. Particular place-based or identity-based communities and their participation in planning processes are considered. Models of community change and local development are reviewed, along with the policies and supportive infrastructure in cities, including Montreal. Local governance, decision-making, and public participation are considered in light of municipal and regional institutions which currently predominate in Canada's metropolitan areas.

URBS 310 *(also listed as GEOG 333) Urban Transportation* (3 credits)

Prerequisite: GEOG 220 or URBS 230 or permission of the Department. This course examines the past evolution and recent functioning of various transport modes in cities around the world. Recent debates about desirable levels of car, transit, and

non-motorized modes feature prominently. Techniques of analyzing urban transport and public policy options are considered in light of burgeoning concerns about sustainable development and the worldwide growth of motorization.

NOTE: Students who have received credit for GEOG 333 may not take this course for credit.

URBS 333 *Urban Laboratory* (6 credits)

Prerequisite: URBS 250 and 260; enrolment in the BA Honours in Urban Planning or BA Specialization in Urban Planning. With an emphasis on first-hand knowledge of an area-based problem, students study an urban problem and simulate solutions. Theory and case studies are used to develop appropriate interventions. Plans are prepared and, under the supervision of the professor, are evaluated by the peer group and experts in the field.

**URBS 335 *(also listed as GEOG 363)*
Geographic Information Systems (3 credits)**

Prerequisite: URBS 250. This course is an introduction to current theoretical and practical approaches to Geographic Information Systems (GIS) through which students acquire basic skills and understanding in the use of GIS for spatial analysis. Training is centred on a series of practical assignments using ArcGIS software and for the term project, students explore the potential of GIS for addressing a real-world problem. Lectures and laboratory.

NOTE: Students who have received credit for GEOG 363 may not take this course for credit.

**URBS 337 *(also listed as GEOG 323)*
Urban Agriculture (3 credits)**

Prerequisite: URBS 230 or GEOG 220 or permission of the Department. This course examines the history and practice of producing food in cities. Students explore the tensions between the politics, economies and ecologies that organize urban food production and the everyday ways people raise and access food in varied urban contexts. The course also critically evaluates food-based social movements: their limits, possibilities and connections to wider struggles for socio-economic justice.

NOTE: Students who have received credit for GEOG 323 or for this topic under a GEOG 398 or URBS 398 number may not take this course for credit.

URBS 338 *Urban Ecology* (3 credits)

Prerequisite: 24 credits; or permission of the Department. Focusing on the impacts of human activities on fauna, flora, soils and air, this course introduces students to ecosystems found in urban environments. This course also examines the flux of energy and materials to and from the city, and places a strong emphasis on policy and planning practices related to urban forestry, site restoration, greening initiatives, environmental justice, and on practices that foster biodiversity and responsible resource management. The course also looks at historical and contemporary views on the relationship between the city and nature.

URBS 362 *Quantitative Research Methods* (3 credits)

Prerequisite: URBS 260. This course covers the most commonly employed methods for quantitative social science research. Students are taught the basics of introductory classical statistics (both descriptive and inferential) and gain experience applying these methods with commonly used software tools and real-world data. Lectures and laboratory.

NOTE: Students who have received credit for URBS 360 may not take this course for credit.

URBS 380 *Urban and Regional Economic Development* (3 credits)

Prerequisite: URBS 230, 240. This course draws on economic and geographical concepts to examine the process of urbanization. Students begin by focusing on the conventional tools and models for analyzing the nature and structure of cities, and at theories concerning the location of economic activity. It also examines key planning issues associated with the (evolving) role of cities as place of production, distribution, and consumption and considers the role of public policy in addressing these issues. Methods for defining and measuring urban economies for the purpose of analysis are reviewed.

URBS 393 *Law and Regulation in Urban Planning* (3 credits)

Prerequisite: URBS 230 and 240. Urban planning as governmental activity is defined by planning legislation in Quebec. This course covers the major bodies of legislation relevant to urban plans, local development plans, environmental protection, agricultural land preservation, heritage, and economic development. The law is a framework for development control and direct intervention at municipal, regional and provincial levels.

NOTE: Students who have received credit for URBS 293 may not take this course for credit.

URBS 398 *Selected Topics in Urban Studies* (3 credits)

Special topics in urban studies.

**URBS 420 *(also listed as GEOG 430)*
Social Geographies of Montreal (3 credits)**

Prerequisite: GEOG 315 or 330; or permission of the Department. This course explores the social and cultural geographies of Montreal with particular emphasis on how the spatial distribution of communities influences urban planning and public policy at the local and regional levels. Complex webs of identities and solidarities informed by socio-economic, linguistic, ethno-cultural, and sexual orientation factors shape the city living experience of individuals and populations alike. Through lectures, discussions, assignments and field trips, students are introduced to a variety of analytical perspectives that investigate the socio-cultural dynamics that contribute to shaping urban settlements, human-environment interactions and local social networks.

NOTE: Students who have received credit for GEOG 430 may not take this course for credit.

URBS 433 *Advanced Urban Laboratory* (6 credits)

Prerequisite: URBS 333 and 393. This is an advanced course in urban design. An overview of current theory and practice is presented. An urban problem is developed and appropriate interventions are considered. These interventions are simulated and the results assessed.

URBS 434 *Transportation GIS* (3 credits)

Prerequisite: URBS 310 and 335, or GEOG 363 and 333; or permission of the Department. This course introduces students to the transportation planning and modelling process aided by the use of a GIS-based transportation decision aid tool. A real-world case-study region and transportation system is used to illustrate the different elements of the planning and modelling process. The course aims to highlight both the strengths and weaknesses (particularly with regard to how it treats the interaction between the transportation system and land use) of the traditional transportation planning approach. Lectures and laboratory.

NOTE: Students who have received credit for this topic under an URBS 498 number may not take this course for credit.

URBS 435 *Transportation Impact Assessment* (3 credits)

Prerequisite: URBS 310 or GEOG 333; URBS 335 or GEOG 363; or permission of the Department. This course introduces students to the quantitative analysis of the environmental (e.g. emissions) and social impacts (e.g. accessibility) of transportation system interventions. Students are introduced to, and gain hands-on experience with, the traditional transportation planning and modelling process aided by the use of a Geographic Information System (GIS)-based transportation decision aid tool. A real-world case-study region and transportation system are used to illustrate the different elements of the planning and modelling process and how this can be used in impact assessment. Lectures and laboratory.

NOTE: Students who have received credit for GEOG 435 or for this topic under a GEOG 498 or URBS 498 number may not take this course for credit.

**URBS 450 *(also listed as GEOG 450)*
Economic Restructuring (3 credits)**

Prerequisite: GEOG 330 or GEOG 380 or URBS 380 or permission of the Department. This course examines the nature of firm restructuring in late capitalism and the implications that industrial restructuring trends are having for the geography of industries, the structure of firms, workplace relations and workers' rights. It examines the new challenges that restructuring presents for both economic development prospects and labour market policies, as well as looks at contemporary initiatives to promote more socially and environmentally sustainable development paths.

NOTE: Students who have received credit for GEOG 450 may not take this course for credit.

URBS 460 *Reading the Urban Form* (3 credits)

Prerequisite: URBS 360 or 362 and completion of 48 university credits; or permission of the Department. This course focuses on the physical reality of the city, or its urban form, as well as the ongoing process of city building and urban morphogenesis. It introduces tools to properly describe, quantify, and interpret urban form in its spatial and temporal dimensions. It seeks to develop a better understanding of the processes of which the contemporary urban artifact is the result. Along with theoretical presentations, the course makes use of case studies conducted in different urban and cultural contexts, and introduces many examples of practical applications of morphological analysis in urban planning and design.

URBS 480 *Impact Assessment* (3 credits)

Prerequisite: URBS 360 or 362 and completion of 48 university credits; or permission of the Department. The impacts of projects on urban and suburban communities and the environment are studied within the context of environmental protection legislation. The methods of assessment are then applied to specific cases.

**URBS 481 *(also listed as GEOG 431)*
Urban Planning in the Developing World (3 credits)**

Prerequisite: GEOG 330 or URBS 380 or permission of the Department. This course explores the growth and planning of large metropolitan areas in developing nations. Issues and problems associated with recent urbanization are examined along with potential solutions offered by urban planning and public policies. The planning roles of institutions including governments, multi-lateral development agencies, and non-governmental organizations are reviewed.

NOTE: Students who have received credit for GEOG 431 may not take this course for credit.

URBS 483 *Directed Studies/Practicum in Urban Planning I* (3 credits)

Prerequisite: Completion of 60 university credits; enrolment in the Specialization in Urban Planning. Through a case study or practicum of 120 hours with a private or public institution, or community interest group, students acquire experience in a professional working environment.

URBS 484 *Directed Studies/Practicum in Urban Planning II* (3 credits)

Prerequisite: Completion of 60 university credits; enrolment in the Specialization in Urban Planning. Through a case study or practicum of 120 hours with a private or public institution, or community interest group, students acquire experience in a professional working environment.

URBS 486 *Behaviour and the Environment* (3 credits)

Prerequisite: URBS 360 or 362 and completion of 48 university credits; or permission of the Department. Human behaviour is seen both as a determinant and as an outcome of environment. Behavioural topics include perception and attitudes, spatial behaviour, spatial cognition, and time-path analysis. Student projects involve applying the theory to a location study, a facility management study, or other relevant application.

URBS 488 Analyzing Choice (3 credits)

Prerequisite: URBS 360 or 362 or GEOG 362; or permission of the Department. This course examines the theory and statistical techniques commonly used to analyze choice. Students design, administer and analyze the results of a stated preference survey on a topic related to people's choices and the environment.

URBS 490 Public Space and the Public Interest (3 credits)

Prerequisite: URBS 360 or 362 and completion of 48 university credits; or permission of the Department. Public space is understood as physical space, as well as the space of media and communications, which are openly accessible to all members of a community. Changing definitions of public space are examined in the context of societal and cultural change. The roles of agents and stakeholders in changing the definitions of public interest are also examined. Legal and normative frameworks for the definition of space, control, and access are also introduced.

NOTE: Students who have received credit for this topic under a URBS 498 number may not take this course for credit.

URBS 491 Honours Thesis or Project (6 credits)

Prerequisite: Completion of 60 university credits; enrolment in the Honours in Urban Planning. Students may undertake independent, supervised research leading to the production of an honours thesis. They may also undertake a major urban study leading to recommendations for public or private interventions.

NOTE: Students who have received credit for GEOG 491 may not take this course for credit.

URBS 495 Field Research (3 credits)

Prerequisite: 60 university credits and permission of the Department. The political, social, and cultural realities of planning in a setting are explored in a field course. Preparation (course meetings and readings) for the field experience at the University is followed by on-site research in the chosen city, where a field investigation is conducted, usually in collaboration with local partner organizations.

URBS 498 Advanced Topics in Urban Studies (3 credits)

Special topics in urban studies.
