

GEOGRAPHY & GEOLOGY

FACULTY

PROFESSOR(S)

W. Osei, B.A. (Hons) (Ghana), M.A.
(Carleton), Ph.D. (Western Ontario)

ASSISTANT PROFESSOR(S)

N. Cameron, B.Sc. (Hons) (Queen's), M.A.,
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PROFESSOR(S) EMERITUS

R. G. Ewing, M.A. (Hons), Ph.D. (Edinburgh);
J. K. McLarty, B.A., M.A., M.Eng. (Western
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DEGREE REQUIREMENTS

Please refer to the general regulations pertaining to academic programs. Students intending to specialize in Geography should consult the department before selecting courses.

Courses in Geography are grouped according to the following categories:

Techniques courses:

- GEOG 2016 to 2027; 3006 to 3096

Systematic courses:

- GEOG 2106 to 2217; 3106 to 3476

Regional courses:

- GEOG 2406 to 2996; GEOG 3496 to 3956

GEOG 3996/3997 Special Topics in Geography I/II may be credited to one of the groups above according to the content of the course in any given session. However, students must request such inclusion by petitioning the Senate Committee on Academic Regulations and Petitions.

BACHELOR OF ARTS (General)

Single Major GEOGRAPHY

First Year

- GEOG 1026/1027*
- 24 additional credits, of which 6 must be from Group I (Humanities) and 6 from Group III (Science)

Second and Third Years

- 12 credits in Techniques/Systematic courses
- 12 credits in Regional courses
- 6 credits in Geography 2000 or 3000 series
- 30 credits electives

* Minimum grade of 60% required.

BACHELOR OF ARTS (General)

Combined Major GEOGRAPHY

Please refer to the general regulations pertaining to combined concentration programs. A combined concentration in the three-year B.A. program requires 30 credits in each of two disciplines. The Geography requirements for the combined concentration are:

First Year

- GEOG 1026/1027*

Second and Third Years

- 12 credits in Techniques/Systematic courses
- 12 credits in Regional courses

* Minimum grade of 60% required.

BACHELOR OF ARTS (Honours)

Single Major GEOGRAPHY

First Year

- GEOG 1026/27*
- 24 additional credits, of which 6 must be from Group I (Humanities) and 6 from Group II (Science)

Second and Third Years

- GEOG 2026*/2027
- 12 credits in Techniques Courses
- 12 credits in Systematic Courses
- 12 credits in Regional Courses
- 18 elective credits

Fourth Year (Thesis Option)

- GEOG 4105
- 6 additional credits 4000 series Geography Courses
- 18 credits electives

Fourth Year (Non-Thesis Option)

- 12 credits 4000 series Geography Courses
- 18 credits electives

* Minimum grade of 60% required.

NOTE:

- Students can complete a maximum of 42 credits at the first year level
- Students can complete a maximum of 78 credits in Geography
- Minimum major average 60%
- Major average for 'honours' designation 70%

BACHELOR OF ARTS (Honours)

Combined Major GEOGRAPHY

First Year

- GEOG 1026/27*

Second and Third Years

- GEOG 2026*/2027
- 6 credits in Techniques Courses
- 6 credits in Systematic Courses
- 6 credits in Regional Courses

Fourth Year

- 12 additional credits 4000 series Geography Courses

* Minimum grade of 60% required.

MINOR IN GEOMATICS

- 60 credits in GEOG core
- 18 credits in the Geomatics minor including:
 - o GEOG 2016/17
 - o GEOG 3006/3037
 - o GEOG 3076/3096
 - o GEOG 4006
- 6 credits in Group I (Humanities)
- 6 credits in Group II (Sciences)
- 30 elective credits (MATH 2086, COSC 1046/47, and COSC 2307 are strongly recommended)

CERTIFICATE IN GEOMATICS

A certificate version of the program is also available. The Certificate in Geomatics will consist of 30 credits from GEOG 1026/27, GEOG 2016/17, GEOG 2026/27, GEOG 3006/3037, GEOG 3046/47, GEOG 3076/3096, GEOG 4006. Students may choose from GEOG 4906/4907 or GEOG 3996/97 when geomatics-related topics are covered.

HONOURS DIPLOMA

The Honours Diploma in GEOG is for students who have graduated with a three-year degree in GEOG (minimum GEOG average of 70%). Admission to the Honours Diploma Program in Geography will require the successful completion of a general degree in Geography with at least a 70% average in all Geography courses required for the degree. An overall average of 70% is required to obtain the Honours Diploma.

Techniques Courses:

GEOG 2016	Introduction to Cartography
GEOG 2017	Introduction to GIS
GEOG 3037	Remote Sensing of the Environment
GEOG 3046	Methods in Geography
GEOG 3056	Field Course in Geography
GEOG 3016	Geography Practicum (Overseas/International/Northern Ontario/Job Placement)
GEOG 3006	Air Photo Interpretation and Image Analysis
GEOG 3096	Topics in GIS Applications
GEOG 3076	Advanced Geographic Information Systems (GIS)

Systematics Courses:

GEOG 2106	Geomorphology I
GEOG 2107	Geomorphology II
GEOG 2206	Population Geography
GEOG 2216	Cultural Geography
GEOG 2217	Social Geography
GEOG 3106	Climatology
GEOG 3115	Biogeography
GEOG 3206	Urbanization and World Cities
GEOG 3207	Understanding the Cityscape
GEOG 3307	Indigenous Knowledge in Natural Resource Management
GEOG 3317	Contemporary Issues in Economic Geography
GEOG 3406	Geography of Health
GEOG 3476	Geography of Hazards and Disasters

Regional Courses:

GEOG 2406	Geography of Canada's Regions
GEOG 2606	World Regional Geography
GEOG 2617	Geography of the Asian-Pacific Rim
GEOG 2996	The Great Lakes: Resources, People, and the Environment
GEOG 2556	Geography of the United States
GEOG 2756	Geography of Ontario
GEOG 3707	Geography of Canada's North
GEOG 3756	Geographies of Development: Theory and Application
GEOG 3807	The Geography of Sub-Saharan Africa
GEOG 3956	Geography of Europe

4000 Series Courses:

GEOG 4006	Geographic Information System Research Project
GEOG 4046	Global Environment Change
GEOG 4206	Directed Studies
GEOG 4217	Population, Environment and Development
GEOG 4226	Seminar in Urban Geography
GEOG 4296	Impact Assessment and Resource Management
GEOG 4407	Natural Resources and the Environment: Policy and Practice
GEOG 4816	Community Planning
GEOG 4906	Advanced Topics I
GEOG 4907	Advanced Topics II

Additional Courses:

GEOG 3996	Special Topics in Geography I
GEOG 3997	Special Topics in Geography II

MINOR IN GEOGRAPHY

A minor in Geography is available to students who are qualifying for a degree program. In all cases, students will be expected to respect all course prerequisite requirements. The minor in Geography consists of the following:

GEOG 1026	Introduction to Physical Geography
GEOG 1027	Introduction to Human Geography

18 credits GEOG, upper year

More information on minors is available in Chapter Three: Academic Policies, Procedures and Regulations.

GEOGRAPHY**COURSE DESCRIPTIONS**

Prerequisites: Except as otherwise noted, courses beyond the first year level normally require completion of a university level course in Geography.

GEOG 1026 Introduction to Physical Geography

A geographical investigation of the natural environment and its links with humankind. An introduction to environmental concepts and spatial systems. Development of skills to describe and interpret environmental data. Lectures and practical assignments. (LEC/LAB 3) (3 cr)

GEOG 1027 Introduction to Human Geography

A geographical appreciation of the various elements of the human landscape. The evolution of regional urban contrasts, related planning strategies, and spatial inequities. Lectures and practical assignments. (LEC/LAB 3) (3 cr)

GEOG 2016 Introduction to Cartography

The course provides an introduction to the concepts, terminology and technologies involved in computer-assisted digital mapping. Basic concepts for understanding geographic information and mapping are emphasized. This course will include both lectures and laboratory work. (LEC 3) (3 cr)

GEOG 2017 Introduction to GIS

This course introduces students to Geographic Information Systems (GIS) including: data capture and input, georeferencing, database structure and management, and cartographic communication. An emphasis is placed on spatial analysis and synthesis operations. Ethical issues arising from locational referencing are also explored. *Prerequisite: Basic computer and operating system knowledge is needed. Basic math knowledge (addition, subtraction, multiplication, division) is also required.* (LEC 3) (3 cr)

GEOG 2026 Introduction to Quantitative Methods

This course provides an introduction to some basic statistical concepts and techniques that are common to all disciplines in the Social Sciences. These include: data collection and description, formulation and testing of hypotheses, time series analysis, and simple linear regression and correlation methods. The majority of examples will focus on applications in geography. Particular emphasis is placed upon computer-based analysis including the use of SPSS and an introduction to computer mapping. *Students may not retain credit for both 2026 and any other introductory statistics course (see program requirements).* (LEC/LAB 3) (3 cr)

GEOG 2027 Spatial Thinking and Quantitative Geography

An overview of fundamental spatial terms and concepts and spatial research questions. It is an extension of GEOG 2026, focusing on quantitative geography including the nature of geographic data, distributions, populations, and samples, hypothesis testing, correlation, regression, data reduction, and spatial pattern analysis. Hands-on exercises completed with the aid of computer software reinforce lecture material. *Prerequisite: GEOG 2026.* (LEC/LAB 3) (3 cr)

GEOG 2106 Geomorphology I

The primary goal of this course is to provide the student with a fundamental understanding of what geomorphology means, the tools used by geomorphologists in understanding landform genesis and what impact understanding geomorphology has on the general population in terms of resource exploration and environmental management. These concepts are woven into the following topic areas: landscape form and structure; earth building and formation of rocks; gradation, weathering and mass movement; and fluvial and karst environments. *Students may not retain credit for both GEOG 2106 and GEOG 2105.* (LEC 3) (3 cr)

GEOG 2107 Geomorphology II

The course builds on the goals introduced in Geomorphology I. Four additional topic areas are covered: eolian environments; glaciated landscapes; periglacial environments; and the global ocean and coastal/shoreline environments. *Prerequisite: GEOG 2106 or consent of the instructor. Students may not retain credit for both GEOG 2107 and GEOG 2105.* (LEC 3) (3 cr)

GEOG 2206 Population Geography

An introductory course focused on the geographic aspects of population studies. Students learn about the processes of population growth, change, and distribution. Patterns of fertility and mortality, and the dynamic processes of migration and mobility are examined. Students also discover linkages between population, the environment, urbanization, and food. *Prerequisite: GEOG 1027 preferred.* (LEC 3) (3 cr)

GEOG 2216 Cultural Geography

This course will provide a study of how various aspects of human cultures are expressed spatially. An examination of the development of the present territorial organization of human societies, with particular reference to value systems, technologies, ideologies, and dynamic acculturation processes are central to the course. Topic areas include language, ethnicity, religion, social customs, population and population movements, human settlements, agriculture. Traditional elders from First Nations Reserves in the area will be invited as guest lecturers. *Prerequisite: GEOG 1026/27 preferred.* (LEC 3) (3 cr)

GEOG 2217 Social Geography

Study of the spatial aspects of human identities and interactions, as well as the spatial configuration of differences and inequalities between people. The course follows a critical approach, meaning that students are encouraged to question and investigate currently accepted social arrangements. *Prerequisite: GEOG 1027 preferred.* (LEC 3) (3 cr)

GEOG 2406 Geography of Canada's Regions

This course explores the many diverse areas of Canada by conceptualizing the regions geographically, then by examining how environmental, historical, economic, social, cultural, and political factors have influenced regional characteristics and settlement patterns. The course investigates current issues facing specific Canadian regions and considers national unity and regional identity. *Prerequisite: None.* (LEC 3) (3 cr)

GEOG 2556 Geography of the United States

A tracing of the spatial development of the United States. Themes include physical geography, history, population, politics, economics, urban and rural development, culture, and spatial inequalities through time. Students discover the various ways that regions in the United States can be envisioned according to different perspectives, and current issues that face specific areas of the United States. *Prerequisite: GEOG 1026/27 preferred.* (LEC 3) (3 cr)

GEOG 2606 World Regional Geography

This course presents an introduction to the geographic region: its creation, its evolution, its functional structures. The course involves a comparative study of the different types of regions in relation to environmental characteristics, resource use, population dynamics and human activities. *Students may not retain credit for both GEOG 2606 and GEOG 2605.* (LEC 3) (3 cr)

GEOG 2617 The Geography of the Asian-Pacific Rim

A comparative study of major characteristics and problems of Asian-Pacific countries, with an emphasis on China and Japan. Analysis of cultural and historical processes, of contemporary spatial, human and economic patterns as well as of new relationships existing between these countries. *Students may not retain credit for both GEOG 2617 and GEOG 2607.* (LEC 3) (3 cr)

GEOG 2756 Geography of Ontario

An exploration of Ontario's human and physical geography and their inter-relationships. The course places a special emphasis on Anishinaabe settlement, and also geographically on Northern Ontario and the Algoma Region. *Prerequisite: GEOG 1026/27 preferred.* (LEC 3) (3 cr)

GEOG 2996 The Great Lakes: Resources, People and the Environment

The course is based on the integrated region of the Great Lakes system of Ontario. The lakes, their physical state and history, and dynamic relationships with peoples, resources, and the environment are the focus of the course. Human settlements, the changing structure of the economy of the region, and issues related to the sustainability of the lake environments and responses are given attention. Emphasis is placed on the Upper Great Lakes, with particular reference to the region of the Lake Huron North-Shore-St. Marys River transition, and the south and eastern Lake Superior region. Priority attention is also given to the dominant peoples of the region, the Anishinaabe or the Indigenous people. *The course will be delivered by lecture and case studies. Prerequisite: GEOG 1026/27 or upper year standing preferred. (LEC 3, field work) (3 cr)*

GEOG 3006 Air Photo Interpretation and Image Analysis

This course is an introduction to the theoretical foundations of remote sensing systems and provides the technical expertise required to extract geometric and thematic information from remotely sensed photographic and digital imagery. The study of aerial photography involves both photogrammetry and photo interpretation. The course will emphasize both aspects and conclude with an introduction to digital multispectral imagery, sensors, platforms, and computer assisted image analysis techniques. Practical studies will involve the interpretation of geomorphic features.

GEOG 3016 Geography Practicum

This course is intended to provide third and fourth year honours students and students in the geomatics certificate program with relevant work and practical experience within government and the private sector. A priority is to place students in positions in the Algoma district, aboriginal settlements, and other parts of northern Ontario. However, opportunities in areas outside northern Ontario, including overseas, will be followed. Flexible paths for placement are utilized. Academic-term duration placement where remuneration is possible or where student can make alternative arrangement for financial support. Student works one full day a week throughout the duration of the placement term. Other time arrangements that meet departmental standards for the geography practicum. (3 cr)

GEOG 3037 Remote Sensing of the Environment

An interdisciplinary approach to remote sensing of the environment. Emphasis is placed on applications to geographic research and applied studies in related disciplines. Imagery interpretation involves the analysis of the spatial data collected by sensors on-board aircraft and spacecraft. Students become familiar not only with conventional photographic imagery but also infrared scanner data, SLAR, and various microwave systems. (Lectures and practical work.)

GEOG 3046 Methods in Geography

This course involves a study of the historical and theoretical development of geography as a field of knowledge from ancient times to the modern period. Emphasis is placed on the methods of geographical research, forms of explanation, the development of ideas and the transmission of knowledge across linguistic divisions. *Prerequisite: Geog 1026/27 or department's permission. (LEC 3) (3 cr)*

GEOG 3056 Field Course in Geography

This course introduces students to field observation methods, measurements, and data gathering techniques for physical geography, natural resources and environmental studies, and land use studies. The course will be offered using a two-week off-campus field school format. It is designed as a hands-on course to be led and supervised by experienced field researchers. Topics and study sites will vary by session to meet academic objectives, student needs and expectations, and resource availability. The Algoma district and Northern Ontario, especially, First Nations settlements and small northern communities, will be emphasized. However, some research contexts, due to their nature and demands, will take students to other parts of Ontario, Canada, or overseas. Students will have a choice of attending a late summer study camp in weeks preceding the start of the Fall term or in the beginning of May to correspond with the spring term at Algoma University. Students are expected to submit a field report of activities as part of the requirements of the course. *Prerequisite: GEOG 1026/1027; GEOG 2017; GEOG 2026 or departmental permission. (EXP 40) (3 cr)*

GEOG 3076 Advanced Geographic Information Systems (GIS)

Building on Introduction to Cartography (GEOG 2016) and Introduction to GIS (GEOG 2017), course topics include: raster data analysis, multi-criteria evaluation, modelling, interpolation, spatial statistics, and advanced vector data analysis. Students also learn how to conduct a GIS project through a term assignment. *Prerequisite: GEOG 2017 required, GEOG 2016 recommended. (LEC 1, LAB 2) (3 cr)*

GEOG 3096 Topics in GIS Applications

Application of Geographic Information Systems to specific subject matter domains within the natural and social sciences and environmental management. The course is project based. Students develop and investigate a spatial research question employing a GIS, with guidance from the instructor and feedback from peers. *Prerequisite: GEOG 2017. (LEC 1, LAB 2) (3 cr)*

GEOG 3106 Climatology

This course is designed to acquaint the student with the dynamics of the earth's atmospheric system and its regional expression. Consideration will be given to both the physical properties and processes of the atmosphere as well as the distribution of weather and climate at micro- and macro-scales. (LEC 3) (3 cr)

GEOG 3115 Biogeography

Biogeography is the study of the spatial patterns of plants and animals and the causes underlying such patterns, both in the past and the present. The rise, development, dispersal, extinction, and the dynamics of the spatial patterning of biota over time, require multidisciplinary information for better understanding. Biogeography, for that matter, cuts across different disciplines. The principles and practice of biogeography have provided insights and guidance for modern species conservation and sustainable resources management practices in general. This course will provide the ecological and historical basis for understanding the distribution and abundance of species and the changes in distribution structure and patterns over time and place. The course will involve lectures, audio-visual presentations, readings, and basic field and laboratory studies. *Prerequisite: Any one or more of Geog 1026/2106/3106 or equivalent preferred. Permission from the department is required for students without any of these courses. (LEC/LAB/EXP 3) (6 cr)*

GEOG 3206 Urbanization and World Cities

Investigation of the urbanization process from a spatial perspective, but also from historical, social, political, economic, and environmental viewpoints. Students explore how and why the first known cities formed, then trace the development of urban systems up until the present, with an outlook to the future. A particular emphasis is placed on the evolution of the urban system in Canada and the United States. The course also stresses the linkages between cities and their roles within nations and the global community. *Prerequisite: GEOG 1027 or upper year standing preferred. (LEC 3) (3 cr)*

GEOG 3207 Understanding the Cityscape

An analysis of the morphology and internal structure of cities from a land use and spatial perspective. Students reflect on the processes by which transport; commercial activities; social, cultural, and economic differences between residents; political decisions; and other factors influence the form and internal characteristics of cities. The course also considers the dynamic nature of cities, urban development players and process, land use conflicts, and city planning and design. *Prerequisite(s): GEOG 1027 or upper year standing preferred. (LEC 3) (3 cr)*

GEOG 3307 Indigenous Knowledge in Natural Resource Management

The course introduces students to Indigenous knowledge systems and their potential role in modern natural resources and environmental management. For their isolation, and a general lack of structure in the mode of acquisition, storage, and dissemination of knowledge, their potential benefits are underutilized, and their continued existence is vulnerable in a rapidly modernizing and globalizing world. The course provides a comprehensive examination of the concept of indigenous knowledge as applied to global indigenous systems, with attention to the aboriginal spatial context in Canada. Practices, tools, techniques, and ideas of indigenous knowledge that contribute to sustainable human livelihood and sustainable resource environments are covered. The process of exchange of indigenous knowledge between and within spatial systems, weaknesses, and mechanisms for enhancing and adopting principles of indigenous knowledge in practices of natural resource management are discussed. The course is organized on the basis of lecture, seminar, aboriginal elder guest lectures, and field trips. *Prerequisite: GEOG 1026/1027 or permission of department. (LEC 3, EXP 12) (3 cr)*

GEOG 3317 Contemporary Issues in Economic Geography

A study of the impact of economic strategies on the distribution of economic activities. Emphasis is placed on the role of various institutions, state and private, which influence economic development. *(LEC 3) (3 cr)*

GEOG 3406 Geography of Health

An introduction to the spatial aspects of health and health care including foundational terms, concepts, theories, methods, and techniques. Topics include determinants of health, access to health services, environmental factors, and climate change. The course highlights health and health care trends and issues in Canada and specifically in Northern Ontario. *Prerequisite: GEOG 2026 OR SOCI 3126. (LEC 2/LAB 1) (3 cr)*

GEOG 3476 Geography of Hazards and Disasters

This course introduces students to environmental hazards and disasters. The course places emphasis on natural geologic, atmospheric, and hydrologic processes that generate hazard conditions that potentially lead to human fatalities or injuries, disrupt economic activities, damage private and public property and infrastructure, and to some extent, disrupt local and regional ecological processes. The scientific principles behind the occurrence of natural disasters are emphasized. Models of risk assessment, risk mitigation, and disaster emergency preparedness form part of the course. A key reminder is that causes that lead to some disasters are also critical for natural environmental functions. For example, volcanoes may cause human deaths but they may help to provide optimal conditions for fertile soils to form, and for geothermal power resources to be available. Understanding causes and effects is an important step for developing hazard mitigation policies. This course will be delivered using classroom lectures, guest lecturers in the field of emergency preparedness, field visits, and assignments. *Prerequisite: GEOG 1026/27 or upper year standing preferred. (LEC 3) (3 cr)*

GEOG 3707 Geography of Canada's North

An examination of how 'Canada's North' is defined geographically, and its relationships with other Nordic countries. Students investigate the way in which human activity and settlement inter-relates with the physical geography of the North including its isolated location, fragile ecosystem, and harsh and changing climate. Additional topics may include: the North's historical background; population and community characteristics; land and resource development; social and cultural environment; health issues; governance; and, Arctic Sovereignty. The course places a focus on Northern Indigenous Peoples. *(LEC 3) (3 cr)*

GEOG 3756 Geographies of Development: Theory and Application

This course applies geographical concepts and analysis to an understanding of contemporary issues in international development and global poverty reduction. The course will identify and examine the characteristics, challenges, opportunities, and stimuli to sustainable development. Various theories of development are analyzed. Furthermore, patterns, diversities, and processes of the physical and human environments that underlie development options are studied. Development and poverty reduction interventions are considered in terms of the agents involved, including international institutions, governments, non-governmental organizations and local people. The course will draw examples and case studies from Africa, Asia, and Latin and South America. Parallel examples will be drawn from the developed world. The course is based on lectures, audio-visual presentations, and assigned readings. *Prerequisite: GEOG 1026/1027 or permission of the department. (LEC 3) (3 cr)*

GEOG 3807 The Geography of Sub-Saharan Africa

This course provides an introduction to the geography of Africa. The course identifies the general patterns, diversities, and processes of the physical and human landscapes of Africa. Opportunities and challenges of the human development process are identified. Throughout the course, spatial differences, comparisons, and case examples, are utilized to explain variations in human features and landscape characteristics. Special emphasis will be given to the identification and analysis of development opportunities in the sub-Saharan region. The course will be based on lectures, audio-visual presentations, and readings. *Prerequisite: GEOG 1026/1027 or permission from the department. (LEC 3) (3 cr)*

GEOG 3956 Geography of Europe

A focus on the evolution of urban, regional, national, and European activities and institutions since 1945. Themes explored include: environment, population, cities, migration, economy, as well as political, cultural, and social dynamics. A special emphasis is placed on the evolution, integration, and expansion of the European Union. Finally, the significance of the EU within the global economy and its future prospects are examined. *Prerequisites: GEOG 1026/27 or upper year standing preferred. (LEC 3) (3 cr)*

GEOG 3996 Special Topics in Geography I

This course will provide advanced coverage of particular topics in Geography or of topics not normally included in other courses, with accompanying practical work. Specific content will vary from year to year depending on which faculty member teaches the course. *Prerequisite: Permission of the department. (LEC/SEM 3) (3 cr)*

GEOG 3997 Special Topics in Geography II

This course will provide advanced coverage of particular topics in Geography or of topics not normally included in other courses, with accompanying practical work. Specific content will vary from year to year depending on which faculty member teaches the course. *Prerequisite: Permission of the department. (LEC/SEM 3) (3 cr)*

GEOG 4006 Geographic Information System Research Project

This course provides students with an opportunity to independently develop a spatial research question, and then investigate the question by designing and implementing an entire project employing a Geographic Information System (GIS). *Prerequisites: GEOG 3076 Advanced GIS, GEOG 3096 Topics in GIS Applications recommended. (LAB 3) (3 cr)*

GEOG 4046 Global Environment Change

The dynamic processes of global environment change, causes, potential impacts across spatial scale and time, and human responses, including the evolution of international and regional policies to deal with environment change. The course focuses on climate change as both a consequence and driver of environment change. The course will cover topics such as the current state of scientific knowledge about climate change, key evidence for climate change in the past, present and future, potential impacts on ecological and human systems, debates and conflicting messages confounding public policy, emerging policy regimes, and risks and uncertainty in decision-making. *(LEC 3) (3 cr)*

GEOG 4105 Senior Thesis

The course consists of supervised reading, research and preparation of an undergraduate thesis under the direction of a faculty member or qualified staff approved by the Department of Geography. *Prerequisite: GEOG 2026/27 and 3047. Students are encouraged to take GEOG 4206 Directed Studies concurrently with GEOG 4105 Senior Thesis. (LEC 3) (6 cr)*

GEOG 4206 Directed Studies

The purpose of the directed studies course is to provide advanced undergraduates in the geography honours program the opportunity to define and undertake individualized research projects under the supervision of a faculty member. It also provides the opportunity for a student to take a course that is not normally offered by the department but beneficial to the academic goals of the student under the tutorship of a faculty member. A maximum of three directed study courses will be approved for any student within the requirements for the honours degree. *Prerequisite: Available only to 3rd and 4th year honours students with a cumulative average grade of B or higher. Highly motivated students or students with special needs who do not meet the recommended grade requirements are encouraged to contact particular faculty members they are willing to work with about the possibility of doing a directed study under their supervision. (3 cr)*

GEOG 4217 Population, Environment and Development

A seminar course in which inter-relationships between the themes of population, environment, and development are explored. *Prerequisite: GEOG 2206 recommended. (SEM 3) (3 cr)*

GEOG 4226 Seminar in Urban Geography

A seminar course exploring contemporary urban geography themes and issues. *Prerequisite: GEOG 3206 or GEOG 3207. (SEM 3) (3 cr)*

GEOG 4296 Impact Assessment and Resources Management

This course introduces students to the context and practice of Environmental Impact Assessment (EIA). The history and theory of impact assessment are examined. As part of this exercise, a comprehensive analysis is provided of the planning processes of Environmental Impact Assessment for various levels of government in Canada and required guidelines for international funding and development agencies. Students will be introduced to impact assessment techniques and explore newer areas of EIA practice, including strategic environmental assessment (EA), cumulative effects assessment, and traditional ecological knowledge (TEK); and social impact assessment (SIA). Students are expected to attend an EIA public hearing in the Sault Ste. Marie region for experience and as an assignment. *Prerequisite: GEOG 1021/1026 or permission of the department. (LEC 3) (3 cr)*

GEOG 4407 Natural Resources and the Environment: Policy and Practice

This course examines the role of natural resources in regional development planning. The strategic use of natural resources to foster a basis for long-term sustainable economic development in resource-rich regions is emphasized. Models and theories of resources and regional development, including notions of 'resource curse', and new development paradigms such as 'sustainable development', provide students with contexts for ideas, tools, and strategies for regional development planning with natural resources. Linkages, networks, innovation flows, and the arms of the national political economy dramatize pertinent external factors that act on internal conditions to influence regional development. While the experience of other regions in Canada is considered, Northern Ontario serves as the main spatial frame for the course. The course is taught by lecture/field studies/and seminar format. *Prerequisite: GEOG 1026/27 preferred or permission of the department. (LEC/SEM 3, FIELD 12) (3 cr)*

GEOG 4816 Community Planning

An introduction to the history, theory, methods and techniques, and practice of urban planning. Sensitivity of planning towards environmental and human health factors is also discussed. Emphasis is placed mainly on the Canadian context. *Prerequisite: GEOG 3207. (LEC/SEM 3) (3 cr)*

GEOG 4906 Advanced Topics I

The topic of this course will vary each year, dependent on the faculty member offering the course. It will be based on the research interests and specialization of the professor's research. *Prerequisite: restricted to students in the four-year program or permission of the instructor. (LEC 3) (3 cr)*

GEOG 4907 Advanced Topics II

The topic of this course will vary each year, dependent on the faculty member offering the course. It will be based on the research interests and specialization of the professor's research. *Prerequisite: restricted to students in the four-year program or permission of the instructor. (LEC 3) (3 cr)*

GEOLOGY COURSE DESCRIPTIONS**GEOLOGY 1006 Introductory Geology I**

This course covers the origin of the solar system and the Earth, focusing on the internal structure of the planet and its significance for the changing character of the Earth's surface, including the distribution and origin of earthquakes, the generation of magma and volcanic activity, continental growth, mountain building and the development of oceans. Other specific topics include: geomagnetism, isostasy, meteorite impact structures, radiometric dating, seismology, and a review of the structure and materials of the other planets in the solar system. The major groups of rocks are reviewed, together with ways in which their field occurrence can be used to determine geological events and history. A field trip across the Sudbury Basin introduces students to interpreting rocks in the field. Laboratory sessions cover topographic maps, geological maps and cross-sections, relative age dating, earthquakes and tectonic movement. *(LEC 3, LAB 3) (3 cr)*

GEOLOGY 1007 Introductory Geology II

This course covers the identification and classification of minerals and sedimentary, igneous and metamorphic rocks, and especially processes involved in their formation, as well as the concentration of minerals in deposits of economic importance. Other topics include weathering and erosion; major events in the geological history of the Earth, including the origin of life, glaciation, and climate change; the nature and value of the fossil record; the fossil fuels; coal, petroleum, and gas; and ground water as a resource. Laboratory sessions cover the identification of rocks and minerals and an introduction to the use of the microscope in examining thin sections of rocks. *Prerequisite: 3 credits in one of GEOL, CHMI, BIOL, or PHYS, or an OAC science. (LEC 3, LAB 3) (3 cr)*

GEOLOGY 1021 Understanding the Earth: The Planet and its Internal Processes

This course provides an introduction to geology for students without a background in science. Topics include: the origin of the solar system and the Earth; the growth and movement of continents; the origin of the ocean basins and sea floor spreading; processes that lead to the deformation of the Earth's crust; mountain building and earthquakes; internal processes; igneous activity, magnetism, and gravity; geologic time and the techniques in relative and absolute dating of rocks. *This is not a credit for geology majors and cannot be taken for credit concurrently with or subsequent to GEOL 1006. (LEC 3) (3 cr)*

GEOLOGY 1022 Understanding the Earth: The Earth's Crust: Rocks and Minerals

This course deals with the rock cycle and the minerals of the crust. Topics include: identification of minerals using their physical and chemical properties; origin and identification of the three rock types: igneous, sedimentary and metamorphic; weathering and erosion of rocks at the Earth's surface. *This is not a credit for geology majors and cannot be taken concurrently with or subsequent to GEOL 1007. (LEC 3) (3 cr)*