

Geography

- **M.A. Geography**
- **M.A. Geography with Specialization in African Studies**
- **M.Sc. Geography**
- **M.Sc. Geography with Specialization in Data Science**
- **Ph.D. Geography**
- **Ph.D. Geography with Specialization in Political Economy**

M.A. Geography

Academic Regulations

See the General Regulations section of this Calendar.

Admission Requirements

The requirement for admission into the master's program is a B.A.(Honours) or B.Sc. (Honours) in Geography or a related discipline, with at least B+ standing.

In exceptional cases, pertinent work experience may be considered in support of an application to the Department. Students entering the program from other disciplines or with academic deficiencies may be required to take additional courses.

Program Requirements

M.A. Geography (5.0 credits)

1. 0.5 credit in:	0.5
GEOG 5000 [0.5]	Approaches to Geographical Inquiry
2. 2.5 credits in:	2.5
GEOG 5909 [2.5]	M.A. Thesis (which must be defended at an oral examination)
3. 0.5 credit in:	0.5
GEOG 5905 [0.5]	Masters Research Workshop
4. 1.0 credit from:	1.0
GEOG 5003 [0.5]	Critical Approaches to Qualitative Inquiry
GEOG 5005 [0.5]	Global Environmental Change: Human Implications
GEOG 5006 [0.5]	Special Topics in Geography of the Environment
GEOG 5201 [0.5]	Special Topics in the Geography of Development
GEOG 5400 [0.5]	Territory and Territoriality
GEOG 5406 [0.5]	Special Topics in Cultural Geography
GEOG 5500 [0.5]	Special Topics in the Study of Cities and Urbanization
GEOG 5502 [0.5]	Special Topics in Geography of Globalization
GEOG 5600 [0.5]	Empire and Colonialism
GEOG 5803 [0.5]	Seminar in Geomatics
GEOG 5804 [0.5]	Geographic Information Systems
GEOG 5900 [0.5]	Graduate Tutorial
ENST 4006 [0.5]	Environmental Policy Analysis
GEOG 4004 [0.5]	Environmental Impact Assessment

GEOG 4021 [0.5]	Seminar in Culture, Identity and Place
GEOG 4022 [0.5]	Seminar in People, Resources and Environmental Change
GEOG 4023 [0.5]	Seminar in Special Topics on the City
GEOG 4024 [0.5]	Seminar in Globalization
GEOG 4040 [0.5]	Geographic Thought
GEOG 4050 [0.5]	Environmental and Geographic Education
GEOG 4303 [0.5]	Urban Planning
GEOG 4304 [0.5]	Transportation Engineering and Planning
GEOG 4008 [0.5]	Advanced Topics in Geographic Information Systems
Or from courses offered by departments in the Faculties of Arts and Social Sciences or Public Affairs and Management	
5. 0.5 credit in free elective	0.5
6. In addition to the formal requirements, M.A. students are required to attend the Departmental Seminar series, and the Graduate Field Camp.	
Total Credits	5.0

M.A. Geography with Specialization in African Studies - Thesis option (5.0 credits)

1. 0.5 credit in:	0.5
AFRI 5000 [0.5]	African Studies as a Discipline: Historical and Current Perspectives
2. 0.0 credit in:	0.0
AFRI 5800 [0.0]	Scholarly Preparation in African Studies
3. 1.0 credit in:	1.0
GEOG 5000 [0.5]	Approaches to Geographical Inquiry
GEOG 5905 [0.5]	Masters Research Workshop
4. 2.5 credits in:	2.5
GEOG 5909 [2.5]	M.A. Thesis (including oral examination of the thesis)
5. 1.0 credit in approved graduate-level electives	1.0
Total Credits	5.0

M.Sc. Geography

Academic Regulations

See the General Regulations section of this Calendar.

Admission Requirements

The normal requirement for admission into the M.Sc. program in Geography is a B.Sc. (Honours) or B.A. (Honours) in Physical Geography or a related discipline, with at least B+ standing.

Students entering the program from other disciplines or with academic deficiencies may be required to take additional courses.

The intended research area must be eligible for NSERC support.

Applicants for admission must provide an outline of their proposed project, which must be suitable for the M.Sc. program.

Program Requirements

M.Sc. Geography (5.0 credits)

1. 0.5 credit in:	0.5
GEOG 5001 [0.5]	Modeling Environmental Systems
2. 0.5 credit in:	0.5
GEOG 5905 [0.5]	Masters Research Workshop
3. 2.5 credits in:	2.5
GEOG 5906 [2.5]	M.Sc. Thesis (must be defended at an oral examination)
4. 1.0 credit in Physical Geography selected from:	1.0
GEOG 5103 [0.5]	Hydrologic Principles and Methods
GEOG 5104 [0.5]	Advanced Biogeography
GEOG 5107 [0.5]	Field Study and Methodological Research
GEOG 5303 [0.5]	Geocryology
GEOG 5307 [0.5]	Soil Resources
GEOG 5803 [0.5]	Seminar in Geomatics
GEOG 5804 [0.5]	Geographic Information Systems
GEOG 5900 [0.5]	Graduate Tutorial
GEOG 4004 [0.5]	Environmental Impact Assessment
GEOG 4013 [0.5]	Cold Region Hydrology
GEOG 4017 [0.5]	Global Biogeochemical Cycles
GEOG 4101 [0.5]	Two Million Years of Environmental Change
GEOG 4103 [0.5]	Water Resources Engineering
GEOG 4104 [0.5]	Microclimatology
GEOG 4108 [0.5]	Permafrost
GEOM 4003 [0.5]	Remote Sensing of the Environment
GEOM 4008 [0.5]	Advanced Topics in Geographic Information Systems
Or from courses offered by departments in the Faculty of Science	
5. 0.5 credit in free elective	0.5
6. In addition to the formal requirements, M.Sc. students are required to attend the Departmental Seminar Series, and the Graduate Field Camp.	
Total Credits	5.0

Notes

- Only 0.5 credit towards the program may be obtained in GEOG 5900 Graduate Tutorial
- Only 0.5 credit may be obtained at 4000 level.

M.Sc. Geography with Specialization in Data Science (5.0 credits)

Requirements

1. 0.5 credit in:	0.5
DATA 5000 [0.5]	Data Science Seminar
2. 0.5 credit in:	0.5
GEOG 5001 [0.5]	Modeling Environmental Systems
3. 0.5 credit in:	0.5
GEOG 5905 [0.5]	Masters Research Workshop
4. 1.0 credit in Physical Geography selected from:	1.0

GEOG 5002 [0.5]	Quantitative Analysis for Geographical Research
GEOG 5103 [0.5]	Hydrologic Principles and Methods
GEOG 5104 [0.5]	Advanced Biogeography
GEOG 5107 [0.5]	Field Study and Methodological Research
GEOG 5303 [0.5]	Geocryology
GEOG 5307 [0.5]	Soil Resources
GEOG 5803 [0.5]	Seminar in Geomatics
GEOG 5804 [0.5]	Geographic Information Systems
GEOG 5900 [0.5]	Graduate Tutorial
up to 0.5 credit in GEOG or GEOM at the 4000 level, with departmental approval	
5. 2.5 credits in:	2.5
GEOG 5906 [2.5]	M.Sc. Thesis (Thesis must be in the area of Data Science, defended at an oral examination)
Total Credits	5.0

Ph.D. Geography

Academic Regulations

See the General Regulations section of this Calendar.

Admission Requirements

The normal requirement for admission to the Ph.D. program is a master's degree (or the equivalent) in geography, with at least an A- average.

A student already registered in the M.A. or M.Sc. program who shows outstanding academic performance and research promise may be permitted to transfer to the Ph.D. program with a recommendation by the Departmental graduate committee.

Applicants whose academic preparation has deficiencies in certain areas may be admitted to the Ph.D. program with the requirement that they complete additional course work.

Admission to the Ph.D. program is granted on a full-time basis in September for the fall term.

Program Requirements

Program requirements for the Ph.D. degree are outlined in the General Regulations section of this Calendar. The specific program requirements of the Department of Geography and Environmental Studies are:

Ph.D. Geography (10.0 credits)

1. 1.0 credit in:	1.0
GEOG 6000 [0.5]	Doctoral Core Seminar:
& GEOG 6001 [0.5]	Geography, Society and the Environment and Doctoral Core Seminar: Geography, Society and the Environment
2. 1.0 credit from:	1.0
GEOG 6003 [0.5]	Field Seminar: Geography of Societal Change
& GEOG 6004 [0.5]	and Field Seminar: Geography of Societal Change

GEOG 6006 [0.5] & GEOG 6007 [0.5]	Field Seminar: Geography of - Environmental Change and Field Seminar: Geography of - Environmental Change	
3. Presentation and oral defence of the thesis proposal as outlined below		
4. 0.0 credit from:		
GEOG 6906 [0.0]	Comprehensive Examination: The - Geography of Societal Change	
GEOG 6907 [0.0]	Comprehensive Examination: The Geography of Environmental Change	
5. 8.0 credits in	Thesis which must be defended at an oral examination	8.0
Total Credits		10.0

Comprehensive Examination

Each doctoral candidate is required to write one comprehensive examination: GEOG 6906 or GEOG 6907, according to the chosen field of specialization

The comprehensive examination must be completed after course requirements for the Ph.D. have been completed. The examination will occur no later than the fourth term of registration in the Ph.D. program. Failure to complete the examination successfully will result in denial of permission to continue in the program.

Thesis Proposal

Candidates normally register in the thesis on entry to the program and work actively to define their research topic during the first term of registration. The thesis proposal is normally presented after comprehensive requirements have been fulfilled. Candidates submit and defend the thesis proposal at an oral examination no later than the end of the 5th term of registration in the Ph.D. program. Continuous registration is required after initial registration in the thesis.

Residence Requirements

All Ph.D. candidates must be registered full time in a minimum of six terms to satisfy the residence requirement.

Ph.D. Geography with Specialization in Political Economy (10.0 credits)

1. 1.0 credit in:		1.0
GEOG 6000 [0.5]	Doctoral Core Seminar: Geography, Society and the Environment	
GEOG 6001 [0.5]	Doctoral Core Seminar: Geography, Society and the Environment	
2. 0.5 credit in:		0.5
PECO 6000 [0.5]	Political Economy: Core Concepts	
3. 0.5 credit from:		0.5
GEOG 6003 [0.5]	Field Seminar: Geography of Societal Change	
GEOG 6004 [0.5]	Field Seminar: Geography of Societal Change	
3. 0.0 credit in:		0.0
GEOG 6906 [0.0]	Comprehensive Examination: The - Geography of Societal Change	
3. Presentation and oral defence of the thesis proposal as outlined below		

4. 8.0 credits in	Thesis which must be defended at an oral examination	8.0
Total Credits		10.0

Comprehensive Examination

Each doctoral candidate is required to write one comprehensive examination: GEOG 6906 or GEOG 6907, according to the chosen field of specialization

The comprehensive examination must be completed after course requirements for the Ph.D. have been completed. The examination will occur no later than the fourth term of registration in the Ph.D. program. Failure to complete the examination successfully will result in denial of permission to continue in the program.

Thesis Proposal

Candidates normally register in the thesis on entry to the program and work actively to define their research topic during the first term of registration. The thesis proposal is normally presented after comprehensive requirements have been fulfilled. Candidates submit and defend the thesis proposal at an oral examination no later than the end of the 5th term of registration in the Ph.D. program. Continuous registration is required after initial registration in the thesis.

Residence Requirements

All Ph.D. candidates must be registered full time in a minimum of six terms to satisfy the residence requirement.

GEOG 5000 [0.5 credit]

Approaches to Geographical Inquiry

A review of the major philosophical perspectives shaping research and explanation by geographers. Particular attention is paid to interpretations of social structure and human action, the nature of the biophysical universe, and the interaction between human beings and their environments.

GEOG 5001 [0.5 credit]

Modeling Environmental Systems

Methods and problems of research on the physical environment, with illustrative material taken from the atmospheric and surface earth sciences. Issues such as the identification and behaviour of environmental systems, temporal and spatial scale, experimental method under field conditions, and simulation and model development are considered.

GEOG 5002 [0.5 credit]

Quantitative Analysis for Geographical Research

Quantitative techniques and methods for research on the natural and cultural environment. Topics include sampling, experimental design, replication, variance, correlation, time series analysis, statistical uncertainty, simulation, calibration, validation.

GEOG 5003 [0.5 credit]**Critical Approaches to Qualitative Inquiry**

Development of critical skills in qualitative research by considering the relationship between theory and method. Engaged scholarship and participatory, community-based, action research. Practical experience with select methods including: interviews, personal narratives, focus groups, participant observation, archival research, discourse analysis, and visual methodologies.

GEOG 5005 [0.5 credit]**Global Environmental Change: Human Implications**

Global environmental change: its significance for societies, economies and international relations. Value systems underlying environmental discourse; political economy of the environment; sustainability and security. Environmental diplomacy and grassroots environmentalism. Regionalized impacts of pressures on natural environments; challenges of adaptation.

Also listed as INAF 5701.

GEOG 5006 [0.5 credit]**Special Topics in Geography of the Environment**

Research seminar on a selected theme within geographical approaches to environmental analysis. Topics will vary from year to year. Consult departmental web site for current details.

GEOG 5103 [0.5 credit]**Hydrologic Principles and Methods**

Advanced physical hydrology with emphasis on atmospheric moisture, precipitation, evaporation, infiltration, soil water physics, snow hydrology and runoff generation. Analytical approaches and methods to solve practical hydrological problems.

GEOG 5104 [0.5 credit]**Advanced Biogeography**

Current methods and theories in paleoecology are examined: dendrochronology, paleolimnology and other techniques for examining past climates and environmental condition. Numerical approaches to climate change studies.

GEOG 5107 [0.5 credit]**Field Study and Methodological Research**

Field acquisition and analysis of geographic material; supervised field observations and methodology. (Individual or group basis, by special arrangement.).

GEOG 5201 [0.5 credit]**Special Topics in the Geography of Development**

Research seminar within geographical approaches to development focusing on a selected theme or region. Topics vary from year to year. Consult departmental web site for current details.

GEOG 5303 [0.5 credit]**Geocryology**

Development of ground ice in permafrost regions of Canada; ice segregation and pore-water expulsion during ground freezing; analytical and numerical approaches to modeling permafrost conditions.

Prerequisite(s): GEOG 4108 or permission of the Department.

GEOG 5307 [0.5 credit]**Soil Resources**

Physical, mineralogical, chemical, and other properties of soils will be studied in agricultural, environmental, geomorphological and/or geotechnical contexts, as relevant to the students enrolled.

GEOG 5400 [0.5 credit]**Territory and Territoriality**

Contemporary geographical and international relations theorizing is challenging notions of boundaries and territories in the political organization of modernity. Using contemporary writings on geopolitics, security, sovereignty, self-determination and identity politics this course investigates territoriality as a political and intellectual strategy.

Also listed as INAF 5402.

GEOG 5406 [0.5 credit]**Special Topics in Cultural Geography**

Research seminar on a selected theme within cultural (including historical) geography. Topic varies from year to year. Consult departmental web site for current details.

GEOG 5500 [0.5 credit]**Special Topics in the Study of Cities and Urbanization**

Research seminar on a selected theme within geographical approaches to the study of cities and urbanization. Topics will vary from year to year. Consult departmental website for current details.

GEOG 5502 [0.5 credit]**Special Topics in Geography of Globalization**

Research seminar on a selected theme within geographical aspects of globalization. Topic varies from year to year. Consult departmental web site for current details.

GEOG 5600 [0.5 credit]**Empire and Colonialism**

Theoretical approaches to empire and colonialism: postcolonial, feminist, Indigenous, anti-racist, queer, decolonizing, and political-economic approaches. Consideration of a range of sites of imperial and colonial formation, including land, territory, nature, the body, sexuality, gender, and race, as well as forms of resistance, resurgence, and decolonization.

GEOG 5701 [0.5 credit]**Topics in Northern Human Geography**

Political, social, economic, cultural, and environmental geographies of the Canadian North and/or circumpolar North. Topics may include climate change, resource development, politics and governance, knowledge and expertise, geopolitics, sovereignty, colonialism, Indigenous knowledge, Indigenous self-determination, conservation and wildlife, environmental politics.

GEOG 5803 [0.5 credit]**Seminar in Geomatics**

Current research issues in geomatics, including remote sensing, geographic information systems, geographic positioning, and cartography. Topics will focus on combined interests of enrolled students and departmental faculty.

Prerequisite(s): prior experience with GIS, GPS, remote sensing or cartography and permission of the department.

GEOG 5804 [0.5 credit]**Geographic Information Systems**

GIS for students with no previous experience. Includes data formats and structures, input/output and analysis capabilities, and GIS applications.

GEOG 5900 [0.5 credit]**Graduate Tutorial**

Tutorial, directed reading or research, offered on an individual basis, to meet specific program needs; may be taken in one of the areas of specialization of the Department.

GEOG 5905 [0.5 credit]**Masters Research Workshop**

A workshop which focuses on the challenges of research design in the various sub-fields of geography. The workshop will culminate with the development and defence of a thesis research proposal.

GEOG 5906 [2.5 credits]**M.Sc. Thesis**

Thesis supervision will be given in Physical Geography, as listed in the introductory section of this department's program description.

GEOG 5909 [2.5 credits]**M.A. Thesis**

Thesis supervision will be given in all areas of specialization of the Department, as listed in the introductory section of this department's program description.

GEOG 6000 [0.5 credit]**Doctoral Core Seminar: Geography, Society and the Environment**

Geographical perspectives on the development of society/environment interrelations in Western thought and critiques thereof. The course is designed to represent and address integrative issues in the two fields of the program, the geography of social change and the geography of environmental change.

GEOG 6001 [0.5 credit]**Doctoral Core Seminar: Geography, Society and the Environment**

Geographical perspectives on the development of society/environment interrelations in Western thought and critiques thereof. The course is designed to represent and address integrative issues in the two fields of the program, the geography of social change and the geography of environmental change.

GEOG 6003 [0.5 credit]**Field Seminar: Geography of Societal Change**

Analysis of current geographical and related research into the three themes of global political economy: restructuring and the environment; geographies of socio-cultural evaluation; and feminist geographies.

GEOG 6004 [0.5 credit]**Field Seminar: Geography of Societal Change**

Analysis of current geographical and related research into the three themes of global political economy: restructuring and the environment; geographies of socio-cultural evaluation; and feminist geographies.

GEOG 6006 [0.5 credit]**Field Seminar: Geography of Environmental Change**

Analysis of geographical and related research into the appraisal and societal management of environmental resources, and environmental processes and anthropogenic impacts.

GEOG 6007 [0.5 credit]**Field Seminar: Geography of Environmental Change**

Analysis of geographical and related research into the appraisal and societal management of environmental resources, and environmental processes and anthropogenic impacts.

GEOG 6906 [0.0 credit]**Comprehensive Examination: The Geography of Societal Change**

This examination focuses on research challenges in theory and methodology in the themes of global political economy: restructuring and the environment; geographies of socio-cultural evaluation; feminist geographies. A specific theme will be identified for each candidate.

GEOG 6907 [0.0 credit]**Comprehensive Examination: The Geography of Environmental Change**

This examination focuses on research challenges in theory and methodology associated with the appraisal and societal management of environmental resources, and environmental processes and anthropogenic impacts. A specific theme will be identified for each candidate.

GEOG 6909 [8.0 credits]**Ph.D. Thesis**