General Studies GNST

Instruction offered under the direction of the Faculty of Communication and Culture. For information contact the Academic Programs Office, 220-6343.

Additional interdisciplinary courses are offered under the course headings African Studies, Canadian Studies, Central and East European Studies, Communications Studies, Development Studies, East Asian Studies, Latin American Studies, Law and Society, Leisure, Tourism and Society, Museum and Heritage Studies, Northern Planning and Development Studies, Science, Technology and Society, South Asian Studies, and Women's Studies.

Junior Course

General Studies 201 **H(3S-0)**

Inquiry Seminar in Communication and Culture

A seminar designed to introduce first year students to intellectual inquiry through an interactive, discovery-based learning experience. Each seminar will explore in depth an interdisciplinary topic such as gender, identity, urban life, technology, the landscape, diversity, future studies, and the like. This exploration will introduce students to the critical skills and perspectives needed to ask good questions and seek good answers in a research context. For current topics consult the Communication and Culture Academic Programs Office or the Faculty Web page.

Note: Restricted to first year students in the Faculty of Communication and Culture.

General Studies 203 **H(3-0)**

Great Ideas

Surveys representative influential ideas from a variety of disciplines. Seeks to articulate the fundamental issues that animate specific disciplines and to illustrate as well as to develop the connections between these ideas. Students will read classic or exemplary texts from fields of study such as science, religion, philosophy, history, politics, psychology, and will explore the possibilities for connecting and integrating the assumptions and methods of these disciplines.

Note: Until August 15, preference in enrollment is given to students in the Faculty of Communication and Culture.

Senior Courses

General Studies 300 **F(3-1T)**

Heritage I - Perspective

Introduction to the interrelationships of disciplines, ideas and problems within contemporary life and their roots in Western European thought using primary source material in literature, philosophy and religion, science and technology, political, economic and social thought and the arts. Emphasis will be placed on understanding and critically evaluating the context of thought within which individuals raised in the Western European tradition think and view the world. Relationships to non-Western European tradition will be discussed. Tutorials will be used to develop skills in the written and oral analysis and evaluation of complex ideas and concepts.

Note: This course is required of every student registered in a Major and General program in the Faculty of Communication and Culture and should be taken as early as possible in the program. Until August 15 preference in enrollment in General Studies 300 is given to students registered in the degree programs of the Faculty of Communication and Culture.

General Studies 301 **H(3-0)**

Special Topics in Interdisciplinary Studies

An examination of current topics in interdisciplinary studies. Also designed for particular expertise of visiting staff and scholars-in-residence.

MAY BE REPEATED FOR CREDIT

General Studies 304 **F(3-0)**
(Bachelor of Accounting Science 304)

Change, Society and Technology

An interdisciplinary study of the concepts of change, its variety of forms and its social-psychological causes and consequences, with an emphasis on the impact of technology.

Note: Credit for both General Studies 304 (Bachelor of Accounting Science 304) and either ~~General Studies 341 or 351 will not be allowed.~~

Note: Students must be registered in the Bachelor of Accounting Science degree program to register in this course.

General Studies 341 **H(3-0)**

Information Technology and Society

A study of the implications of information technology for political, social and economic organization, individual psychology, and concepts of knowledge. Historical, ethical and legal implications will be discussed.

Note: Credit for both General Studies 341 and either Communications Studies 380 or General Studies 304 (Bachelor of Accounting Science 304) will not be allowed.

Note: This course assumes only very basic familiarity with computers at the "user" level. Familiarization with more advanced applications will be provided as required.

General Studies 351 **H(3-0)**

Change

Analysis of the concept of "change" and related concepts such as "revolution," "evolution," "progress," "development." Social and psychological causes and consequences of change in its various forms - institutional, technological and intellectual. Brief discussion of possible future changes to be expected.

Note: Credit for both General Studies 351 and 304 (Bachelor of Accounting Science 304) will not be allowed.

General Studies 357 **H(3-0)**

Controversial Non-Fiction

Individuals from appropriate disciplines will each choose a current work written for non-specialists and will provide background and a framework for a critical assessment of each work. The works assessed will vary from year to year.

General Studies 359 **H(3-0)**

Introduction to World Music

A survey of the world's music through the study of selected culture areas. Emphasis will be on the dynamics of each musical idiom, on the relationships between music and other aspects of culture and society, and on the interaction among various cultures.

Note: Until August 15 preference in enrollment is given to students enrolled in the degree programs offered by the Faculty of Communication and Culture.

General Studies 401 **H(3-0)**

Concepts in Comparative Heritage

Presents a thematic approach to interdisciplinary cultural studies and provides methods and experience for intercultural comparative studies with a global perspective. Aspects of three selected non-European cultures will be included.

Prerequisite: General Studies 300.

General Studies 500 **F(3-0)**

Heritage II - Integration

A continuation of General Studies 300 emphasizing the integration of information acquired during the student's undergraduate career, developing interrelationships among the different subject areas that have dominated the Western European tradition, and exploring how these relationships might change in the future.

Prerequisite: General Studies 300.

Note: This course is required of every student registered in a Major program in the Faculty of Communication and Culture.

General Studies 501 **H(3-0)**

Research in Selected Topics

Supervised individual study of a special topic.

Prerequisite: Consent of the Associate Dean (Academic).

Note: Students should normally contact the office of the Associate Dean (Academic) prior to the first day of classes to arrange an independent study course.

MAY BE REPEATED FOR CREDIT

General Studies 502 **F(3-0)**

Research in Selected Topics

Supervised individual study of a special topic.

Prerequisite: Consent of the Associate Dean (Academic).

MAY BE REPEATED FOR CREDIT

General Studies 590 **F(3-0)**

Honours Thesis: Directed Research

Supervised individual research and preparation of thesis.

Prerequisite: Consent of the Honours Program Coordinator.

Note: Required of and limited to senior students in the Honours program in Communication and Culture.

Geography GEOG

Instruction offered by members of the Department of Geography in the Faculty of Social Sciences.

Department Head – D. Draper

Geography courses are designated Area II or Area III.

All students interested in taking Geography courses, Geography Majors and Graduate Students, should read the pertinent Undergraduate and Graduate

program sections of the Calendar.

Illustrative UnderGraduate Course Groupings

This listing provides guidelines to assist students in their selection of related groups of geography courses, and is intended to be neither exhaustive nor exclusive.

Physical Geography: 201

- Climatology/Hydrology: 305, 403, 405, 415, 503, 515
- Geomorphology: 307, 407, 409, 423, 445, 507, 511
- Soils Geography/Ecology: 313, 413, 417, 513, 517, 519

Human Geography: 203

- Economic and Transportation Geography: 341, 441
- Geography of Health Care: 411
- Historical and Political Geography: 365, 367
- Urban Social Geography: 351, 451, 551, 553

Regional Geography: 213

- The Americas: 371, 379, 381
- Special Regions: 377, 383, 387, 389, 425, 463, 577, 590, 592
- Resources, Conservation and Recreation: 321, 327, 421, 429, 527

Techniques and Methodology:

- Remote Sensing/Mapping: 333, 433, 437, 531, 533, 535
- Analytical Methods: 339, 391, 435, 439, 447, 537, 547, 591, 593

A more detailed statement of content for geography courses is available from the Department office.

Junior Courses

Geography 201 **H(3-2)(Area III)**

The Physical Environment

Introduction to the physical elements of the environment such as weather, climate, hydrology, landforms, soils, vegetation, and the processes producing variations of these elements on the surface of the earth. Examples of environmental inter-relationships and problems that affect people are emphasized.

Geography 203 **H(3-2)(Area III)**

The Human Environment

The study of people, their origins, culture, technology, economy and impact on the environment. The manner in which people attempt to impose order upon the surface of the earth. Concepts of relative location will be introduced with particular regard to both the external orientation and the internal organization of urban areas. Some emphasis will be placed on student projects in the laboratories.

Geography 213 **H(3-0)(Area II)**

Geography of World Affairs

Focuses on the major culture regions of the world and also individual countries. Emphasis on the characteristics, distribution, inter-relationships and comparisons of the major culture and physical phenomena of these areas, i.e. population, political situation, economy, language, religion and environment. Some historical developments in each of the areas are presented for perspective, but the major emphasis is on the background for understanding contemporary world affairs.

Senior Courses

Geography 305 **H(3-2) (Area III)**

Weather and Climate

Physical principles of meteorology and climatology. Weather development in relation to different scales of atmospheric circulation. Elements of synoptic and dynamic climatology as determinants of characteristics and the distribution of climates. Laboratory work emphasizes North American examples.

Prerequisite: One junior half course in Area III (Geography 201 is recommended).

Geography 307 **H(3-2)(Area III)**

Landform Processes and Morphology

A systematic study of the origin, nature and distribution of landforms. Laboratory work will include several field trips and geomorphic interpretation of maps and air photographs.

Prerequisite: Geography 201 or Geology 201 or 203 or 209.

Note: Credit for both Geography 307 and Geology 373 will not be allowed.

Geography 313 **H(3-2)(Area III)**

Soils and Vegetation

Soil: physical, chemical and biological properties, and the environmental and spatial relationships of vegetation patterns.

Prerequisite: Geography 201.

Geography 321 **H(3-0)(Area II)**

Environmental Problems and Resource Management

Environmental and resource issues, with emphasis on topics such as ethics; sustainability; policy and decision making; and management strategies. Case examples highlight issues on resource sectors such as freshwater, oceans, parks and wildlife, forests and energy.

Prerequisite: A previous course in geography or consent of the Department.

Geography 327 **H(3-0)(Area II)**
(formerly Geography 427)

Tourism and Recreation Geography

Dimensions of tourism and recreation: scales and impacts of human activities on recreational resources and environments; planning for sustainable tourism; cultural and heritage tourism; adventure and eco-tourism; development and management issues.

Note: A previous course in geography is strongly recommended.

Geography 333 **H(3-3)(Area III)**

Mapping and Remote Sensing

Basic instruction in the use and interpretation of remote sensing imagery, and in thematic mapping principles. Identification, interpretation and mapping of both physical and cultural landscape features and remote sensing imagery.

Prerequisite: Geography 201 or 203 or Geology 201 or 203 or 209 or consent of the Department.

Geography 339 **H(3-2)(Area III)**

Analytical Methods in Geography I

Introduction to qualitative and quantitative research methodology, sampling and survey design in geography. Covers the background analytical techniques for an understanding of geographic literature. Examples will involve the use of statistical computer packages.

Prerequisite: Geography 201 or 203 or consent of the Department.

Geography 341 **H(3-0)(Area II)**

Introduction to Economic and Transportation Geography

Theories, concepts and techniques of economic and transportation geography with emphasis on policy issues relating to Canadian examples at the provincial and national levels.

Prerequisite: Geography 203 or 213 or any two senior half courses in Area II or consent of the Department.

Geography 351 **H(2-1T)(Area II)**

Urban Social Geography

Concepts of urban geography with particular reference to intra-urban social issues.

Prerequisite: Geography 203 or Urban Studies 201 or consent of the Department.

Geography 365 **H(3-0)(Area II)**

Political Geography

Spatial study of political systems, structures and processes, and their relationship to geographic factors.

Prerequisite: A previous course in geography or consent of the Department.

Geography 367 **H(3-0)(Area II)**

Population Problems

Spatial distribution of population, including density composition and characteristics; patterns of migration and settlement in selected areas.

Note: A previous course in geography is strongly recommended.

Geography 371 **H(3-0)(Area II)**

Introduction to Latin America

A survey of the physical, cultural and historical geography of Latin America.

Note: A previous course in geography is strongly recommended.

Geography 377 **H(3-0)(Area II)**

Africa

Dimensions and underlying causes of issues facing African peoples: the colonial legacy, fragile environment, cultural and political diversity, population growth, resource development, urbanization, and economic challenges.

Note: A previous course in geography is strongly recommended.

Geography 379 **H(3-0)(Area II)**

The United States of America

The physical and cultural framework of the country and its historical significance. The patterns and characteristics of geographic regions.

Note: A previous course in geography is strongly recommended.

Geography 381 **H(3-0)(Area II)**

Canada

The regional geography of Canada. The physical framework of Canada and its significance in Canada's historical development. The concept of the geographic region, the patterns and characteristics of these regions, with selected detailed studies.

Note: A previous course in geography is strongly recommended.

Geography 383 **H(3-0)(Area II)**

The United Kingdom

The interrelationships between the physical and human geographies of the United Kingdom.

Note: A previous course in geography is strongly recommended.

Geography 387 **H(3-0)(Area II)**

Former Soviet Union

Systematic and topical geography of the former Soviet Union. Aspects of economic activity, transportation, regional development, settlement patterns and population distribution.

Prerequisite: Geography 203 or 213 or consent of the Department.

Geography 389 **H(3-0)(Area II)**

Australia, New Zealand, Oceania

A regional survey of the physical environment, resources, land use, population and political geography of Australia, New Zealand and Oceania.

Note: A previous course in geography is strongly recommended.

Geography 391 **H(80 hours)(Area III)**

Geographic Field Studies

An introduction to field research techniques and topics in physical and human geography. Lectures and projects will provide an introduction to a range of geographic disciplines. Field exercises will normally be conducted away from Calgary for about ten days before Labour Day.

Prerequisite: Consent of the Department. One of the following is recommended: Geography 201, 203, Geology 201, 209.

Note: Enrollment in Geography 391 may be limited. Only declared Majors in Geography, Earth Science, Environmental Science and Minors in Transportation Science may be admitted prior to August 15. Applications from other students will be reviewed after August 14.

Geography 397 **H(3-0)(Area II)**

Regional Geography of Selected World Areas

Selected regional geographies. A survey of the physical, cultural and historical geography of a world region. Consult the Department for the specific regional offering in any given year.

Prerequisite: A previous course in geography is strongly recommended.

MAY BE REPEATED FOR CREDIT

Geography 403 **H(2-2)(Area III)**

Physical Oceanography and Climatic Variability

Oceanic circulation and air-ocean interactions as controls of climate. Wave and current dynamics. Role of sea-ice in energy transfers. Climatic variability in historic time and the instrument period.

Prerequisite: Geography 305 or consent of the Department.

Geography 405 **H(3-2)(Area III)**

Applied Climatology

Role played by weather and climate in determining environmental quality. Storms, floods, droughts and human adjustment to severe weather. Urban and rural climates, air pollution. Climate in agriculture and forestry. Implications of Canada's climate(s) for the nation's water resources, agriculture and forests.

Prerequisite: Geography 305 or consent of the Department.

Geography 407 **H(3-2)(Area III)**

Physiographic Problems in Western Canada

Physiographic problems related to fluvial, glacial and applied geomorphology with emphasis on the Pleistocene history of the local area.

Prerequisite: Geography 307 or Geology 373.

Geography 409 **H(3-0)(Area III)**

Arctic and Mountain Permafrost

Development and distribution of permafrost in highlands and the northern regions of North America and Eurasia. Environmental systematics. Problems and solutions.

Prerequisite: Geography 307 or Geology 373.

Geography 411 **H(3-0) (Area II)**

Geography of Health Care

Examination of geographic research on the determinants of health and disease, including environmental, social, behavioural and political factors. Main themes include: disease ecology, health care delivery, and environment and health.

Prerequisites: Geography 203, and any one of Geography 321, 341, 351, 365, 367; or consent of the Department. Geography 339 is also recommended.

Geography 413 **H(3-2)(Area III)**
(Archaeology 413)

Soil Characteristics and Formation

Characteristics of soils and the processes and factors of soil formation. Soil development related to geomorphic materials, geomorphic events, anthropogenic sources, and erosional and depositional landscapes.

Prerequisite: Geography 313 or consent of the Department.

Geography 415 **H(3-2)(Area III)**

Hydrology

The physical basis of water utilization and management. Elements of the hydrologic cycle - precipitation, ground water and stream flow. Techniques for estimating water yield and renewal potential in drainage basins.

Prerequisites: Geography 305 or 307, and 339 (or a course in Statistics by consent of the Department).

Geography 417 **H(2-3)(Area III)**

Biogeography and Natural Ecosystems

Environmental and spatial relationships of plant communities. Interpretation of soil-plant interrelationships applied to the classification and geographic distribution of natural ecosystems.

Prerequisite: Geography 313 or consent of the Department.

Geography 421 **H(3-0)(Area II)**

Renewable Resources and Natural Environments

Geographical resources analysis and management approaches applied to resource sectors such as urban natural areas, wilderness parks and reserves, freshwater resources and fisheries.

Prerequisite: Geography 321 or consent of the Department.

Geography 423 **H(3-2) (Area III)**

Landscape Evolution

Examination of large-scale geomorphological processes underlying landscape evolution. Hillslope and channel systems are emphasized. Evaluation of historical and modern approaches to the study of landscape evolution. Methodological issues with reference to large-scale geomorphology are examined.

Prerequisites: Geography 307 and 339; or consent of the Department.

Geography 425 **H(3-0)(Area II)**

Critical Approaches to Development: Theory and Applications

A critical approach to meanings of economic and social development and the theories of development from a spatial perspective. Other areas of study include: population and health dynamics, gender and development, rural development, industrialization, formal and informal economies, foreign aid, trade and debt, community development. Case studies from Latin America, Asia and Africa.

Prerequisite: Geography 365 or consent of the Department.

Note: Not open to students with credit in Geography 375.

Geography 429 **H(3-0)(Area II)**

Tourism and Recreation Environments

Approaches to and issues in recreation and environmental management; recreational activities and management issues within a range of representative tourism and recreational environments; case studies emphasize assessment and monitoring, policy initiatives and decision-making, and other practical orientations.

Prerequisite: Geography 327 or consent of the Department.

Geography 433 **H(2-3)(Area III)**

Remote Sensing of the Environment

Principles of earth resource analysis using digital images collected from instruments on airborne and spaceborne platforms. The full range of the electromagnetic spectrum currently used in remote sensing. Emphasis will be given to complementing conventional data and methods with automated techniques.

Prerequisite: Geography 333 or consent of the Department.

Geography 435 **H(3-3)(Area III)**

Surficial Deposit, Terrain and Hazard Mapping

A laboratory and field-oriented course in the recognition and mapping of surficial sedimentary deposits, terrain (geomorphic) units, environments of deposition and natural hazards from aerial photography, satellite imagery, Digital Elevation Models (DEMs), and field surveys. Field work component will involve sediment texture and facies identification.

Prerequisites: Geography 307 or Geology 373; and Geography 333 or consent of the Department.

Geography 437 **H(2-3)(Area III)**

Applied Mapping Techniques

Beginning to end map production, including rapid and high precision surveying techniques (such as laser leveling, theodolite and GPS surveying), digital data compilation and manipulation, and advanced map design and production. This project-oriented course involves field surveying exercises in September and October and computer based map production projects later in the session.

Prerequisites: Geography 201; and Geography 333 or consent of the Department.

Geography 439 **H(3-2)(Area III)**

Analytical Methods in Geography II

Methods for the analysis of temporal, spatial and multivariate data sets. Emphasis is placed on data sets relating to geographic phenomena, resource utilization and environmental problems, with examples from the geographic literature. Examples will involve the use of computer packages.

Prerequisite: Geography 339 or consent of the Department.

Geography 441 **H(3-0)(Area II)**

Advanced Economic and Transportation Geography

The processes of economic location in a global context. Sub-topics include: the importance of transportation networks; decision-making within firms; differences between small, medium-sized and large companies; corporate restructuring; inter-firm networks; and public policy issues.

Prerequisite: Geography 341 or consent of the Department.

Geography 445 **H(3-2) (Area III)**

Glacial Geomorphic Systems

Evaluation of hypotheses and theories on the formation of glacial landforms and sediments. Glacial mechanics, erosion, deposition, and hydrology. Timing and dynamics of glaciation and deglaciation in Alberta.

Prerequisite: Geography 307 or consent of the Department.

Geography 447 **H(3-3)(Area III)**

Geographic Information Systems

The development of Geographic Information Systems (GIS). Data collection, storage, and display; algorithms for sorting, searching, and spatial manipulations. Discussion of appropriate computer hardware and software. Case studies of Canadian and foreign GIS in the private and public sectors. This course will involve the use of raster-based GIS packages.

Prerequisites: Geography 333 and 339 or consent of the Department.

Geography 451 **H(3-0)(Area II)**

Urban Systems Development

A critical review of the principles of urban growth and development in the context of systems of cities. Topics include: single factor explanations, such as central place, long distance trade models, industrial and service growth; cumulative development models; society explanations.

Prerequisite: Geography 351 or consent of the Department.

Geography 463 **H(3-0)(Area II)**

Cities, Poverty and Development

Analysis of the explosive growth and geographical character of Third World cities. Topics normally include: rural-urban migration, development theory and urbanization, housing, formal/informal labour market, service and food provision, social and political conflict. Case studies from Latin America, Asia and Africa.

Prerequisite: Geography 351 or 365 or consent of the Department.

Geography 503 **H(2-2)(Area III)**

Glaciology and Climatic Change

Feedback processes between the atmosphere and ice-sheets. Continental and mountain glaciation. Paleoclimatology of glacial fluctuations. Role of variable gases and dust in the atmosphere. Climatic change in prehistoric time.

Prerequisites: Geography 305 and 403, or consent of the Department.

Geography 507 **H(3-2)(Area III)**

Field Study in Physiography

Field study of physiographic problems and field techniques with special reference to the local area.

Prerequisite: Geography 307 or Geology 373 or consent of the Department.

Geography 511 **H(3-4)(Area III)**

Fluvial Geomorphology and Field Methods

Research approaches and field techniques in studies of fluvial parameters, channel processes, morphology, sedimentology and deposition models, mapping of textural facies and depositional environments.

Prerequisite: One of the following: Geography 307, Geology 373, Geology 381, or consent of the Department.

Geography 513 **H(3-2)(Area III)**

Applied Soil and Ecological Classification Systems

Soil and plant community characteristics and soil classification applied to ecological land classification, environmental impact assessment, land use suitability evaluation, and watershed management.

Prerequisite: Geography 413 (Archaeology 413).

Geography 515 **H(3-2)(Area III)**

Applied Hydrology

Dam and reservoir water management, irrigation forms, stream routing and flood control, municipal water supply, well development and water conservation. Canadian water resources are emphasized.

Prerequisite: Geography 415 or an equivalent course in Engineering by consent of the Department.

Geography 517 **H(3-2)(Area III)**

Wildland Ecosystems in Western Canada

Application of basic principles to the interpretation of biotic, physical and human inter-relationships, classification and spatial distribution of wildland ecosystems.

Prerequisite: Geography 417 or consent of the Department.

Geography 519 **H(3-0)(Area III)**

Landscape Ecology and Dynamics

Concepts and methods for examining the spatial pattern of natural and managed landscapes and their effects on ecological processes. Applications in land management and biological conservation will also be considered.

Prerequisites: One of Geography 313 or Biology 313 and one of Geography 339 or Biology 315 or consent of the Department. At least one of the following is also strongly recommended: Geography 417, 421, 517, or Ecology 419, 439, 501.

Geography 527 **H(2-2)(Area II)**

Research and Planning for Tourism and Recreation Resources

Research and techniques in analysis, planning and management of touristic and recreational resources, including case studies.

Prerequisite: Geography 327 or 427 or 429.

Geography 531 **H(2-3)(Area III)**
(formerly Geography 599.12)

Remote Sensing and Forest Ecology

Advanced digital image analysis used in forest ecological studies including mapping, monitoring and modelling. Includes field work and computer labs.

Prerequisite: Consent of the Department.

Note: Normally offered only in Summer Session.

Geography 533 **H(2-3)(Area III)**
(formerly Geography 599.94)

Topics in Remote Sensing

Advanced topics of current interest in remote sensing theory and applications. Chosen topics vary by session. Laboratory work on advanced image analysis techniques and integrating raster and vector systems.

Prerequisite: Geography 433 or consent of the Department. Geography 547 is recommended.

Geography 535 **H(2-3)(Area III)**

Environmental Image Analysis and Modelling

Advanced digital image analysis of aerial and satellite remote sensing data in environmental and physical geography studies including mapping, monitoring, and modelling the natural landscape.

Prerequisite: Geography 433.

Geography 537 **H(2-3)(Area III)**
(formerly Geography 599.11)

Geographic Information Systems in Forest Ecology

Techniques of forestry landscape analysis and modelling using multiple digital data types within a GIS framework; fundamental operations, issues and applications. Field and computer work.

Prerequisite: Consent of the Department.

Geography 547 **H(3-3)(Area III)**

Geographic Information Systems: Developments and Applications

Advanced topics in the theory and application of Geographic Information Systems. This course will involve the use of vector-based GIS packages.

Prerequisite: Geography 447 or consent of the Department.

Geography 551 **H(3-0)(Area II)**

Advanced Urban Geography

Selected topics in the field, such as the processes of growth in urban systems or urban ecology.

Prerequisites: Geography 351 and 451 or consent of the Department.

Geography 553 **H(3-0)(Area II)**

Globalization and the City

Introduction to the economic, political and cultural forces operating on a global scale that increasingly shape the growth and development of cities. Emphasis is placed on the dynamics of growth, competition, and polarization that structure urban hierarchies as well as cities' internal social and economic geographies.

Prerequisite: One of Anthropology 379, 387, Economics 361, Geography 351, Sociology 353, Urban Studies 201, or consent of the Department.

Geography 590 **F(3-7)(Area III)**

Overseas Field Studies in Physical and Environmental Geography

Field research and reconnaissance survey techniques applied to regions outside North America. Individual and group travel-study combined with formal instruction and seminars.

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Geography 591 **H(2-1)(Area III)**

Consolidation Seminar in Geography

Concepts and methods of geographical enquiry are blended with modules of faculty career experiences, potential career opportunities, nature and scope of graduate student research, and exposure to personal field research and data collection.

Prerequisite: Open only to Geography Majors and Minors who have completed 4.5 full-course equivalents of the core program, normally in the final Winter Session of program.

Note: This course is required of all Geography Majors.

Geography 592 **F(3-7)(Area II)**

Overseas Field Studies in Social and Economic Geography

Field research and data collection techniques applied to geographical phenomena in regions outside North America. Periods of individual and group travel-study are interspersed with formal instruction and seminars.

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Geography 593 **H(3-0)(Area II)**

Concepts and Methods of Geographical Enquiry

Major ideas and methods of geographical enquiry. Contemporary methodological debates.

Prerequisites: Three full courses in geography or consent of the Department.

Geography 597 **H(3-0)(Area II)**

Selected Topics in Geography

Content of this course will vary from year to year. Consult Department for details.

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Geography 599 **H(3-0)(Area III)**

Selected Topics in Geography

Content of this course will vary from year to year. Consult Department for details.

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Graduate Courses

Geography 609 **H(3-0)**
(Anthropology 609) (Archaeology 609)

Human Ecological Systems

The development of human ecology, its current directions and application of analytical techniques as they apply to anthropology, archaeology and geography.

Prerequisite: Consent of the Department.

Geography 619 **H(3-2)**

Spatial Ecology

Applies the principles of landscape ecology and conservation biology to the study of spatial effects on individual species and on the structure, dynamics, diversity and stability of multi-species communities. The use of GIS and remote sensing technologies is a central theme. Topics include habitat fragmentation, metapopulation analysis and viability, wildlife habitat modelling (static and dynamic), management of endangered species, and spatial decision support. Other aspects of this course include the importance and use of indicator, umbrella, keystone and flagship species in conservation.

Prerequisite: Consent of the Department.

Note: Not open to students with credit in Geography 695.11.

Geography 633 **H(3-3)**

Research and Applications in Remote Sensing

Review of basic and advanced principles of image analysis; advanced laboratory techniques. Integration of remote sensing with GIS; current research in remote sensing. Project organization; data sources for remote sensing.

Prerequisite: Consent of the Department.

Geography 639 **H(3-3)**

Advanced Spatial Analysis and Modelling

History of spatial modelling in geography; comprehensive coverages of techniques, spatial analysis and spatial modelling as currently used within GIS and remote sensing.

Prerequisite: Consent of the Department.

Geography 647 **H(3-3)**

Advanced Research and Applications in Geographic Information Systems

Focus on advanced GIS applications in core areas; methodological developments in GIS, and current research directions in GIS.

Prerequisite: Consent of the Department.

Geography 681 **H(3-0)**

Geographic Information Systems Project: Theoretical Issues

A critical and comprehensive review of information and literature on a GIS research topic This course provides the conceptual basis for Geography 683.

Prerequisites: Geography 633, 639 and 647; or consent of the Department.

Geography 683 **H(3-0)**

Geographic Information Systems Project: Application

Implementation of a project on a GIS topic which will involve demonstrating mastery of GIS project design and the implementation and presentation of results commensurate with graduate level work. This topic will relate to material covered by the student in Geography 681.

Prerequisite: Geography 681 or consent of the Department.

Geography 691 **H(3-3)**

Advanced Fluvial Geomorphology

Contemporary concepts and issues, research methodologies, experimental design, and applied aspects of fluvial geomorphology. A seminar-based course with field trip components.

Prerequisite: Geography 511 or consent of the Department.

Geography 695 **H(3-0)**

Seminar in Geographic Research Methods

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Geography 697 **H(3-0)**

Seminar in the Philosophy and Nature of Human Geography

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Geography 699 **H(3-0)**

Seminar in the Philosophy and Nature of Physical Geography

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

A list of specific subtitles for the 700-level courses listed below is available in the Department.

Geography 795 **H(3-0)**

Selected Topics in Geographic Research Methods

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Geography 797 **H(3-0)**

Selected Topics in Human Geography

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Geography 799 **H(3-0)**

Selected Topics in Physical Geography

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Geology GLGY

Instruction offered by members of the Department of Geology and Geophysics in the Faculty of Science.

Department Head – L. R. Lines

Students interested in taking geology courses are urged to read the advice in the Faculty of Science Program section of this Calendar.

Junior Courses

Geology 201 **H(3-3)**

Principles of Geology and Geophysics I

Composition and internal structure of the Earth; surface processes; internal processes and global tectonics. Laboratory: Rocks and minerals, topographic and geologic maps.

Note: Credit for both Geology 201 and 209 will not be allowed.

Geology 203 **H(3-3)**

Principles of Geology and Geophysics II

Sedimentary environments; methods of interpreting Earth history; major events in the history of the Earth and its life; applications of plate tectonics; regional geology and resources of North America; global change. Laboratory: Stratigraphic and structural analysis; relative and radiometric age dating; applications of paleontology.

Prerequisite: Geology 201.

Note: Credit for both Geology 203 and 213 will not be allowed.

Geology 209 **H(3-0)**

Introduction to Geology

Basic concepts regarding the major features of Earth; its rock and mineral composition, processes controlling erosion, deposition and surface structures; formation of mountains, ocean basins and continents; internal structure of the Earth and plate tectonics.

Note: Credit for both Geology 209 and 201 will not be allowed.

Note: A non-major course for Education, Humanities, Social Sciences and Science students. Not available as a course in the Fields of Geology or Applied and Environmental Geology. Students pursuing degrees in Geology and Geophysics must take Geology 201.

Senior Courses

Geology 301 **H(3-0)**

Geology of the Mountain Regions of Western Canada

Selected topics encountered in introductory physical geology will be pursued in greater depth in order to explain the geology of Western Canadian Mountain Parks and adjacent areas.

Prerequisite: Geology 201 or 209.

Note: A non-major course for Education, Humanities, Social Sciences and Science students. Not available as a course in the Fields of Geology or Applied and Environmental Geology.

Geology 307 **H(3-0)**

Geological History of Life

The history of life from the earliest records to the present. Fossils, geological time, extinction, basic paleontology. The rise and development of various animals and plants including dinosaurs, mammals and humans.

Note: A non-major course for Education, Humanities, Social Sciences and Science students. Not available as a course in the Fields of Geology or Applied and Environmental Geology.

Geology 309 **H(3-1)**

Gemology

A survey of the major gems and semi-precious stones from a mineralogical point of view. Emphasis will be on their physical and chemical properties and on their geological origins and occurrences. Modern instrumental methods of gem identification are used in the laboratory.

Prerequisite: Geology 201 or 209.

Note: A non-major course for Education, Humanities, Social Sciences and Science students. Not available as a course in the Fields of Geology or Applied and Environmental Geology.

Geology 311 **H(3-1T-3)**

Minerals and Rocks

Identification of rocks and rock-forming minerals in hand sample and under the binocular microscope; rock classification; interpretation of rock textures and structures; introduction to the petrographic microscope; orthoscopic optical techniques; elementary petrology.

Prerequisites: Geology 203 or 213; Chemistry 201.

Geology 313 **H(3-1T-3)**

Crystallography and Optical Mineralogy

External and internal symmetry, chemistry, structure and conoscopic optical properties of crystalline material as a basis for more refined identification of rock-forming minerals.

Prerequisite: Geology 311.

Geology 317 **H(3-0)**

Chemical Geology

A survey of topics in chemical geology. No previous background in chemistry assumed. Topics may include radioactive dating and geologic time, origin and evolution of the atmosphere and oceans, thermal and chemical evolution of the continental and oceanic crust, economic uses of minerals, geothermal systems, nuclear waste disposal, and forensic geology. Demonstrations of principles from lecture material will include topics such as crystal growing and use of a polarizing microscope to identify common rocks and minerals.

Prerequisite: One of Geology 201, 209, or consent of the Department.

Note: Offered in odd-even dated academic years.

Note: A non-major course for students in Education, Social Sciences, Humanities, or Science. Not available as a course in the Fields of Geology or Applied and Environmental Geology.

Geology 337 **Q(80 hours)**

Geologic Field Methods I

Mapping geology at large and small scales; detailed maps will be prepared using pace, compass, triangulation; measurement of sections with staff and tape; preparation of field reports. The field work will concentrate mainly on sedimentary rocks and deposits and basic structural geology. Field exercises will normally be conducted away from Calgary for about ten days before Labour Day.

Prerequisite: Geology 203 or 213.

Note: Enrollment in Geology 337 may be limited. Only Majors in a degree program requiring this course will be admitted prior to August 15. Applications from other students will be reviewed after August 14 and consent of the Department is required in addition to course prerequisite.

Note: This course occurs in rugged field conditions and varying weather, for which participants must be prepared and equipped. Students may be required to cover food and accommodation costs.

Geology 339 **Q(80 hours)**

Geologic Field Methods II

Mapping geology at large and small scales; detailed maps will be prepared using pace, compass, triangulation, plane-table mapping; measurement of sections with staff and tape; preparation of field reports. The field work will concentrate mainly on igneous and metamorphic rocks and basic structural geology. Field exercises will normally be conducted away from Calgary for about ten days after Winter Session Final Examinations. Preparatory tutorials during Winter Session may be required.

Prerequisites: Geology 311, 337.

Note: This course occurs in rugged field conditions and varying weather, for which participants must be prepared and equipped. Students will be required to cover food and accommodation costs.

Geology 341 **H(3-3)**

Structural Geology

Mechanical principles involved in the deformation of rocks; classification of tectonic structures in stratified and non-stratified rocks; geological mapping; manipulation of structural data and its predictive use.

Prerequisites: Geology 203 or 213, and Mathematics 251 or 249 or Applied Mathematics 217.

Geology 373 **H(3-3)**

Surficial Geology

Surface processes and deposits, and their implications for land use, neotectonics, and paleoenvironmental interpretations.

Prerequisite: Geology 203 or 213.

Note: Credit for both Geology 373 and Geography 307 will not be allowed.

Note: Applied and Environmental Geology majors must complete Geology 373.

Geology 377 **H(3-3)**

Petroleum Engineering Geology

The principles and methods of physical geology with special emphasis on their application to the exploitation of oil and gas. Laboratory: properties of minerals and rocks, analysis and interpretation of surface and subsurface maps, interpretation of borehole logs and core, properties of sedimentary rocks.

Note: This course is primarily for engineering students and is not available as a course in the fields of Geology or Applied and Environmental Geology.

Geology 381 **H(3-1T-3)**

Stratigraphy and Sedimentation

Stratigraphic principles and sedimentary processes which are related to the understanding of the types and occurrence of sedimentary rocks.

Prerequisite: Geology 203 or 213.

Geology 391 **H(3-3)**

Paleobiology

Principles of classification, comparison of fossil with modern forms, morphology of invertebrate fossils, their evolutionary history and paleoecologic significance.

Prerequisite: Geology 203 or 213.

Geology 399 **H(3-0)**

Topics in Geology

Selected topics of current interest in paleontology, stratigraphy, sedimentology and structural geology.

Note: A general interest course for Education, Humanities, Social Sciences and Science students. Not available as a course in the Fields of Geology or Applied and Environmental Geology.

MAY BE REPEATED FOR CREDIT

Geology 401 **H(3-3)**

Physical Hydrogeology

Hydrologic cycle, conservation principle, Darcy's Law, groundwater flow systems, aquifer testing, soil hydrology, effective stress, land subsidence, solute transport.

Prerequisites: Geology 201; Physics 223; and Mathematics 253 or 263 or Applied Mathematics 219.

Note: Credit for both Geology 401 and 601 will not be allowed.

Note: Completion of Geology 373 is highly recommended prior to taking this course.

Geology 415 **H(3-0)**

Geology and the Concept of Darwinian Evolution

The development of ideas about organic evolution, and their application in science and other areas of human society, will be discussed. Particular emphasis will be given to the geological evidence for evolution of life on Earth, both that known to Darwin and utilised by him in formulating his Theory of Evolution, as well as that which has subsequently become available.

Prerequisite: Geology 201 or 209.

Note: A general interest course for students in Education, Humanities and Social Sciences. Not available as a course in the Fields of Geology or Applied and Environmental Geology.

Note: Offered in even-odd dated academic years.

Geology 429 **H(3-3)**
(formerly Geology 329)

Geochemical Thermodynamics

Application of chemical thermodynamics to problems in igneous, metamorphic and sedimentary geology, and aqueous geochemistry. Using thermodynamic computations to construct and interpret pressure-temperature diagrams, log (activity) diagrams and equilibrium constants and activity products. Other topics as time permits.

Prerequisites: Chemistry 201, 203; Geology 311, 313; Mathematics 221; Mathematics 253 or 263 or Applied Mathematics 219; Physics 211 or 221, and 223.

Geology 437 **Q(80 hours)**

Mapping in Sedimentary Terrains

Field study of sedimentary and structural geologic problems. Students will progress to independent mapping and professional report writing that integrates many techniques and may include the use of microcomputers in map compilation. Field exercises will normally be conducted away from Calgary for about ten days before Labour Day.

Prerequisites: Geology 313, 339, 341, 381.

Note: Enrollment in Geology 437 is restricted to Geology and Applied and Environmental Geology majors.

Note: Registration after August 1 will require consent of the Department.

Note: This course occurs in rugged field conditions and varying weather, for which participants must be prepared and equipped. It may occur outside Canada. Students are normally required to cover food and accommodation costs.

Geology 439 **Q(80 hours)**

Mapping in Igneous and Metamorphic Terrains

Field study of igneous, metamorphic and structural geologic problems. Students will progress to independent mapping and professional report writing that integrates many techniques and may include the use of microcomputers in map compilation. Field exercises will normally be conducted away from Calgary for about ten days after Winter Session Final Examinations.

Prerequisite: Geology 437.

Note: This course occurs in rugged field conditions and varying weather, for which participants must be prepared and equipped. It may occur outside Canada. Students will be required to cover food and accommodation costs.

Geology 441 **H(160 hours)**

Field Techniques in Hydrogeology

The course entails a week at a hydrogeology field site on the Fraser River delta, British Columbia. Hydrogeology and geotechnical techniques will be demonstrated and will involve hands-on participation by students. After the field work, students will conduct extensive analysis and interpretation of data gathered during the field session, complete exercises and prepare a written report. The course normally runs for about three weeks following Winter Session Final Examinations.

Prerequisites: Geology 401 and consent of the Department.

Note: Credit for both Geology 441 and 639 will not be allowed.

Note: This course has limited enrollment and priority will be given to Applied and Environmental Geology majors. Students are normally required to cover food and accommodation costs.

Geology 443 **H(3-3)**

Igneous and Metamorphic Petrology

Petrogenesis of igneous and metamorphic rocks. Study of igneous rock associations to illustrate principles. Metamorphic facies and their tectonic setting. Pressure-temperature evolution of metamorphic rocks.

Prerequisites: Geology 313, 329 or 429, 339.

Note: Credit for both Geology 433 and 443 will not be allowed.

Geology 461 **H(3-3)**

Sedimentary Petrology

Origin of sedimentary rocks, including the physics and chemistry of their formation. Laboratory includes hand specimen and microscopic petrography, and grain size and shape analysis.

Prerequisites: Geology 313, 339, 381, 391; Chemistry 201, 203; Physics 211 or 221, and 223; Mathematics 253 or 263 or Applied Mathematics 219.

Note: Completion of Statistics 213 or 357 is highly recommended prior to taking this course.

Geology 471 **H(3-3)**

Geology, Engineering, and the Environment

The principles and methods of physical geology with special emphasis on their application in dealing with civil engineering and environmental problems. Laboratory: properties of minerals and rocks, analysis and interpretation of geological maps, photogeology and seismic refraction in site investigation problems.

Note: Credit for both Geology 471 and either 271 or 371 will not be allowed.

Note: This course is primarily for engineering students, and is not available as a course in the fields of Geology or Applied and Environmental Geology.

Geology 475 **H(3-3)**

The Geological Record of Global Change

Magnitude and causes of changes in the solid earth-ocean-atmosphere system will be examined. Topics will include variation in ocean chemistry and Earth climate through time, as preserved in the rock record. Both long term (hundreds of millions of years) and shorter term (thousands of years) changes will be examined. Potential climate change as a result of anthropogenic influences will also be examined.

Prerequisites: Geology 201 and Chemistry 203.

Note: Not available as a course in the Fields of Geology or Applied and Environmental Geology.

Geology 499 **Q (80 hours)**

International Field Courses

Field research and techniques applied in areas outside Canada.

Prerequisites: Geology 201, 203, and consent of the Department.

Note: This course may occur in rugged field conditions and varying weather, for which participants must be prepared and equipped. Students will be required to cover food and accommodation costs and may be required to cover transportation costs.

Note: Geology 499 is not in the field of Geology.

MAY BE REPEATED FOR CREDIT

Geology 503 **H(3-3)**
(formerly Geology 403)

Aqueous Geochemistry

Theoretical and applied aspects of aqueous solution chemistry. Topics include: methods for collection and preservation of water samples in the field, laboratory analysis of waters, theory and application of aqueous thermochemical models.

Prerequisite: Geology 329 or 429.

Note: A weekend field excursion will be run in September.

Geology 505 **H(3-3)**

Contaminant Hydrogeology

Chemical and biological processes in surface water and groundwater systems. Topics include: water quality, contaminant transport and dispersal, fluid-sediment interactions, remediation of contamination. Techniques will include the use of thermochemical models, numerical modelling of contaminant migration, and examination of case studies.

Prerequisites: Geology 403 or 503 and one of 401, 501, or 601.

Geology 510 **F (0-9)**

Senior Thesis

A written report based on independent study. Originality is emphasized, laboratory and field studies are encouraged. Published material may be included.

Prerequisites: Consent of the Department and of a departmental faculty member who will act as a supervisor.

MAY BE REPEATED FOR CREDIT

Geology 527 **H(3-1T-3)**

Ore Deposits

Processes of formation of metallic ore and diamond deposits. Classification of ores based on petrologic association. Introduction to ore microscopy.

Prerequisite: Geology 433 or 443.

Note: Normally offered in even-odd dated academic years. However, this course may be offered in any year in which sufficient interest is indicated to the Department prior to November 1 of the preceding academic year.

Note: A weekend field trip will be run in September.

Geology 531 **H(3-1T-3)**
(formerly Geology 431)

Advanced Igneous Petrology

Mineralogical and chemical classifications of igneous rocks. Physics and chemistry of igneous rock formation. Laboratory includes hand specimen and microscopic petrology.

Prerequisites: Geology 329 or 429, 341, 433 or 443.

Geology 533 **H (3-1T-3)**

Advanced Metamorphic Petrology

Theoretical and applied problems in metamorphic petrology. Phase equilibria; geothermometry and geobarometry; kinetics of metamorphic processes. Integration of metamorphic petrology with structure, geochronology and tectonics. Laboratory includes petrogaphic studies of rock suites and possibly instrumental analysis (e.g. electron probe, XRD).

Prerequisite: Geology 443.

Note: Normally offered in even-odd dated academic years. However, this course may be offered in any year in which sufficient interest is indicated to the Department prior to November 1 of the preceding academic year.

Geology 541 **H(3-1T-3)**

Advanced Structural Geology

Structural features of complexly folded strata; simple statistical analysis of data; structural analysis in plutonic and metamorphic rocks; applications to exploration and exploitation.

Prerequisite: Geology 341.

Note: Credit for both Geology 541 and 641 will not be allowed.

Note: A weekend field excursion will be run in September.

Geology 555 **H(3-3)**

Global Geology

Global aspects of plate tectonics and regional geology through time. Application of fundamental stratigraphic and structural principles. Contributions of geophysics, geochemistry, experimental and theoretical petrology to the modern plate tectonic model. Analysis and interpretation of major structural provinces as they relate to plate boundary interactions.

Prerequisite: Geology 433 or 443 or Geophysics 359 or consent of the Department.

Geology 561 **H(3-1T-3)**

Facies Analyses and Sequence Stratigraphy

An integrated approach to the study of sedimentary rocks with emphasis on environmental interpretation. Outcrop sections and core suites will be studied in detail.

Prerequisites: Geology 439 or 441, 461 and fourth year standing.

Note: Normally offered in odd-even dated academic years. However, this course may be offered in any year in which sufficient interest is indicated to the Department prior to November 1 of the preceding academic year.

Note: Field exercises for the entire class will be run during the five days preceding the start of Fall Session lectures.

Geology 571 **H(3-1T-3)**

Engineering Geology

Application of geology to engineering problems with emphasis on the geologic aspects of site and environmental investigations. Characterization of rock masses and surficial deposits and examination of their behaviour; special mapping methods, air photo interpretation and the application of some geophysical techniques.

Prerequisites: Geology 341 and Geophysics 355.

Note: Completion of Geology 401 is highly recommended prior to taking this course. Students who have not completed Geology 401 are advised to attend the tutorial session of Geology 571, offered during January block week.

Geology 577 **H(3-1T-3)**

Petroleum Geology

Principles and theory of hydrocarbon accumulation; maturation, migration and trapping. Global occurrences of petroleum. Techniques of subsurface geology. Geophysical log theory and interpretation.

Prerequisites: Geology 341, 381, and one of Geology 439 or 441 or Geophysics 457; fourth year standing is required.

Note: Normally offered in odd-even dated academic years. However, this course may be offered in any year in which sufficient interest is indicated to the Department prior to November 1 of the preceding academic year.

Note: It is recommended that students have knowledge of spreadsheets sufficient to pass Computer Science 203, and a working knowledge of the DOS computer operating system.

Geology 587 **H(3-3)**

Stratigraphy and Paleontology of Western Canada

Principles of stratigraphic analysis, historical geology, and paleontology; topics may include sequence stratigraphy, biostratigraphy and correlation, paleoecology, and biogeography. Case histories will be largely selected from strata of Western Canada. Laboratories are based on the application of paleontology for the interpretation of earth history.

Prerequisite: Geology 461.

Geology 597 **H(3-3)**

Numerical Models and Geostatistics

Analysis of numerical geological data, estimation and hypothesis testing, application of multivariate techniques in geology. Introductory geostatistics.

Prerequisites: Geology 341; Mathematics 253 or 263 or Applied Mathematics 219; Mathematics 221; or consent of the Department.

Note: Completion of Mathematics 331 and/or Statistics 357 is highly recommended prior to taking this course.

Graduate Courses

Graduate students are urged to read the Geology and Geophysics Department section in the Graduate Studies calendar. Only where appropriate to a student's program may graduate credit be received for courses numbered 500-599. Courses numbered 600 are available to fourth-year students who obtain Departmental approval and who have credit for the prerequisite courses.

Geology 601 **H(3-3)**

Advanced Physical Hydrogeology

An advanced treatment of topics covered in Geology 401.

Prerequisite: Consent of the Department.

Note: Credit for both Geology 601 and either 401 or 501 will not be allowed.

Geology 603 **H(3-3)**

Advanced Aqueous Geochemistry

Advanced discussion of theoretical and applied aspects of aqueous geochemistry of natural waters. Topics include: methods for collection and preservation of water samples in the field, laboratory analysis of waters, theory and application of aqueous geochemical models to complex formation, solubility, stability of low temperature mineral assemblages, oxidation and reduction processes in natural environments and reaction path modeling. Applications of stable isotopes to low temperature geochemical processes may also be covered.

Prerequisite: Geology 403 or 503, or Geophysics 457.

Geology 605 **H(3-1T)**

Topics in Subsurface Flow and Transport

Topics of current interest in subsurface flow and transport such as mathematical models of flow and transport, simulation methods, aquifer or petroleum reservoir characterization.

Prerequisite: Geology 401 or 601 or consent of the Department.

Note: It is recommended that students have sufficient knowledge of elementary computer programming to pass Computer Science 203.

Geology 607 **H(3-3)**

Advanced Subsurface Hydrology

Coverage of more advanced topics in subsurface hydrology including flow and transport in fractured media, stress-flow coupling, two-phase flow, infiltration, well hydraulics, anisotropy and heterogeneity, and hydrodynamic dispersion.

Prerequisite: Geology 401 or 601 or consent of the Department.

Note: It is recommended that students have a background in Darcy's law, Theis theory, and advection-dispersion equation.

Geology 627 **H(3-3)**

Ore Deposits

A detailed study of ore occurrences with special emphasis on Canadian deposits. Laboratory: the study of comprehensive suites from deposits.

Prerequisite: Geology 527.

Geology 633 **H(3-3)**

Advanced Igneous and Metamorphic Petrology

Theoretical and applied problems in petrology, including some or all of: numerical techniques in petrology, phase equilibria, geothermometry and geobarometry, kinetics in petrology, physics and chemistry of magmatic processes. Laboratory will consist of petrographic study of rock suites.

Prerequisite: Geology 433 or 443 or equivalent or consent of the Department.

Geology 639 **H(160 hours)**

Field Laboratory in Groundwater Hydrogeology

The course entails a week at a hydrogeology field site on the Fraser River delta, British Columbia. Hydrogeology and geotechnical techniques will be demonstrated and will involve hands-on participation by students. After the field work, students will conduct extensive analysis and interpretation of data gathered during the field session, complete exercises and prepare a written report. Relative to Geology 441, Geology 639 requires more sophisticated analyses of data and additional exercises. Geology 639 normally runs for about three weeks following Winter Session Final Examinations.

Prerequisites: Geology 401 or 601 and consent of the Department.

Note: Credit for both Geology 441 and 639 will not be allowed.

Note: This course has limited enrollment.

Geology 641 **H(3-3)**

Advanced Structural Methods

Analysis of mesoscopic and megascopic structural data; the construction and analytical use of cross-sections, subsurface maps and 3-dimensional models; structural analysis of the Canadian Cordillera.

Prerequisite: Consent of the Department.

Note: Credit for both Geology 541 and 641 will not be allowed.

Note: A weekend field excursion will be run in September.

Geology 655 **H(3-0)**

Evolution of Sedimentary Basins

Basement tectonics; basin initiation and basin fill patterns; driving mechanisms for subsidence; backstripping and subsidence analysis; quantitative basin modeling; basin-scale fluid flow; heat and mass transport; oil and gas migration. Emphasis will be on Canadian examples of different basin types (e.g. foreland, strike-slip, rift) as analogues for basins in other parts of the world.

Prerequisite: Consent of the Department.

Geology 663 **H(2-1)**
(formerly Geology 699.03)
Physics 663

Applications of Stable Isotopes

Applications in archaeology, biology, chemistry, engineering, geography, geology, medicine, meteorology, paleontology, physics and space sciences. Topics include hydrology, paleoclimates, ore deposits, geothermometry, fossil fuels exploration and recovery, pollutant tracing, food webs forensic investigations.

Prerequisite: Consent of the Department.

Geology 673 **H(3-1T)**

Quaternary Geology

Stratigraphic nomenclature and classification; absolute and relative chronology; evidence and consequences of environmental change; methods of interpreting Quaternary history.

Prerequisite: Geology 373 or Geography 307.

Note: This course will include a Saturday field trip.
Note: Offered in even-odd dated academic years.

Geology 677 **H(3-3)**

Advanced Topics in Oil and Gas Production

Advanced study of the problems related to production of conventional oil, heavy oil, and natural gas; analysis of interactions of oil, water and gas; the effects of fluid properties, rock structure and capillary, gravity and viscous forces acting on the reservoir system; application to the design of improved oil and gas recovery methods.

Prerequisite: Petroleum Engineering 513 or consent of the Department.

Note: Credit for both Geology 677 and either Chemical Engineering 619.26 or 677 will not be allowed.

Geology 679 **H(3-1)**

Petroleum and Environmental Organic Geochemistry

Origin of petroleum; sedimentation of organic matter and the carbon cycle; diagenesis of organic matter; hydrocarbon generation and migration; kinetic models; creosote contamination; methods; interpretation of geochemical data; applications of geochemical data to geological and environmental problems.

Prerequisite: Consent of the Department.

Geology 691 **H(3-3)**

Micropaleontology

Principles of micropaleontology; sample preparation, classification, biostratigraphy, paleoecology, and evolution of several microfossil groups, with emphasis on the Conodonta.

Prerequisite: Geology 391.

Note: Offered in even-odd dated academic years.

Geology 699 **H(3-3)**

Selected Topics in Geology

Courses are offered in specific topics in areas such as geochemistry, hydrology, mineralogy, paleontology, petroleum geology, petrology, quantitative geology, sedimentology, structural geology, and surficial geology.

MAY BE REPEATED FOR CREDIT

Geology 701 **H(0-6)**

Advanced Independent Study

A written report based on laboratory and field studies is required.

Note: Open only to graduate students in the Department of Geology and Geophysics.

Geology 703 **H(0-6)**

Readings in Geology

Note: Open only to graduate students in the Department of Geology and Geophysics.

Geology 707 **H(3-3)**

Geology and Geophysics of Western Canada

Topics include stratigraphy, sedimentology, structure, petrology, geophysics and economic geology. Laboratories contain a field component.

Note: Open only to graduate students in the Department of Geology and Geophysics and compulsory for beginning doctoral students in Geology.

Geology 729 **H(3-3)**

Sedimentary Geochemistry

Application of chemical and isotopic data and techniques to the mineral assemblages observed to form during diagenesis. Water-rock interactions are examined using the thermodynamics of solution-mineral-gas equilibria. Topics may include kinetics, reaction path modelling, fluid flow in sedimentary basins and the relationships between fluid flow and diagenetic events.

Geology 733 **H(3-3)**

Analytical Methods in Petrology

Topics may include scanning electron microscope, electron probe, x-ray diffraction and x-ray fluorescence.

Geology 741 **H(3-3)**

Problems in Structural Geology

Theoretical and experimental aspects of structural geology.

Geology 745 **H(3-3)**

Advanced Topics in Geochemical Dynamics

Theory, mathematical, and computational tech-

niques in geochemical dynamics, kinetics and reactive transport. Course may be given by distance education in collaboration with University of Alberta and University of British Columbia.

Geology 793 **H(3-0)**

Topics in Paleontology

Topics may include organic evolution, biostratigraphy and correlation, functional analysis of fossil organisms, paleobiogeography.

Note: Offered in even-odd dated academic years.

Geology 795 **H(3-3)**

Stratigraphic Palynology

Detailed survey of the stratigraphic and geographic distribution of spores and pollen with emphasis on Devonian to Recent strata.

Prerequisite: Geology 695.

Geomatics Engineering ENGO

Instruction offered by members of the Department of Geomatics Engineering in the Faculty of Engineering.

Department Head – G. Lachapelle

Associate Heads – N. El Sheimy, S.H. Skone

Senior Courses

Geomatics Engineering 343 **H(3-3)**

Fundamentals of Surveying

Differential levelling including precise methods and instruments and the Modified Princeton Test; heights by other methods; angular and gyrotheodolite measurements; distance measurements by taping, optical methods, and EDM; basic principles; basic features of instruments; testing, adjustment and calibration of instruments; measurement procedures; accuracies. Computations: traverse and area, the first and second geodetic problem on the plane, trig sections, station and target eccentricities, coordinate transformations. Route Surveying: route location, horizontal and vertical curves, sight distance, slope staking, earth work computations, mass diagram. Routine procedures: setting out straight lines and right angles, measurement with obstructions. Mapping by tacheometry or total station. Setting out surveys: alignment and grade for roads, sewers and pipelines, bridges, buildings, dams, tunnels. Mining surveys.

Prerequisites: Engineering 319 and one of Physics 269 or 369.

Geomatics Engineering 351 **H(3-3)**

Introduction to Geospatial Information Systems

Design and operation of Geospatial Information Systems (GISs) and their role in digital mapping and spatial data management including: concepts of information and GIS, the multipurpose cadastre, spatial data management systems, georeferencing, land information modelling, spatial representation, geoprocessing, input/output operations, file storage, data base management systems, and distributed processing. Techniques involved in project specification, design and implementation, and the selection of computer hardware/software for GISs.

Prerequisite: Engineering 335.

Geomatics Engineering 361 **H(3-3)**

Adjustment of Observations

Familiarization with Geomatics engineering methodology and estimation. Classes and combination of mathematical models. Least squares method: parametric, condition and combined cases. Problem formulation and solution: theory of errors and adjustment of observations, analysis of trend, problems with a priori knowledge of the parameters, step by step methods, sequential solution methods, summation of normals. Univariate and multivariate statistical testing applied to Geomatics engineering.

Prerequisites: Engineering 233 and 319.

Corequisite: Applied Mathematics 309.

Geomatics Engineering 419 **H(3-3)**
(formerly Geomatics Engineering 519)

Geomatics Networks

A systematic approach to the "Geomatics Network Analysis and Optimal Design," that are two of the most important processes in establishing a Geodetic Network. Network concepts and their implementation. Reference systems and surfaces, datum, and fiducial networks. Observational models for terrestrial and extraterrestrial measurements of type position and gravity. Measures of precision and accuracy of coordinates. Reliability, data snooping, variance component analysis. Implementation aspects for different types of networks. Integration of satellite observations into geodetic and photogrammetric networks. Deformation analysis. New network concepts. WADGPS and the concept of dynamic network.

Corequisite: Geomatics Engineering 423.

Geomatics Engineering 421 **H(3-3)**

Coordinate Systems and Map Projections

Basic concepts of geodesy. Cartesian, curvilinear and map coordinates. Theory of map projections, differential geometry. Graticule classifications, azimuthal, conic and cylindrical projections, UTM and 3TM. Reference systems and frames. Gravity and natural coordinates. Ellipsoidal coordinates and ellipsoidal calculations. Geoid and ellipsoid. Datum problems. Inertial frame, celestial coordinates, precession, nutation, Earth rotation, polar motion. Time and time systems (sidereal, solar, atomic).

Prerequisites: Engineering 335 and Applied Mathematics 309.

Geomatics Engineering 423 **H(3-3)**

Geodetic Positioning

Concepts of geodetic positioning. Review of reference systems, geodetic models and atmospheric effects. Satellite geodesy, Kepler's laws and orbit geometry. Satellite-based positioning, global positioning system (GPS), satellite laser ranging (SLR) and radar altimetry. Astronomic positioning, very long baseline interferometry (VLBI). Vertical positioning and height systems. Kinematic positioning, inertial techniques, multi-sensor systems.

Prerequisites: Geomatics Engineering 343, 361 and 421.

Geomatics Engineering 427 **H(3-3)**
(formerly Geomatics Engineering 527)

Physical Geodesy

The gravity field and the geoid in science and engineering. Newtonian gravitation, modelling of ideal bodies, accelerations in a rotating frame, gravity. Elements from potential theory, vector calculus, Gauss divergence, Green's theorems, boundary value problems. Laplace and Poisson equations, solutions in spherical harmonic and Fourier series. Legendre functions. The normal field. Gravimetry. Gravity reductions, isostasy. Geoid determination, Stokes's formula, combination methods.

Prerequisite: Geomatics Engineering 421.

Geomatics Engineering 431 **H(3-3)**

Analytical Photogrammetry

The role of photogrammetry in mapping applications (image acquisition and image measurement). Mathematical relationships between image and object space. Direct and inverse problems of projective and similarity coordinate transformations. Conditions of collinearity and coplanarity. Orientation procedures (Interior, Exterior, Relative and Absolute). Measurement and correction of image coordinates. Stereomodel formation and error analysis. Various mathematical models strip and block adjustments. Project planning.

Prerequisites: Applied Mathematics 309 and Geomatics Engineering 361.

Geomatics Engineering 435 **H(3-3)**
(formerly Geomatics Engineering 555)

Remote Sensing

A survey of modern quantitative remote sensing using optical, infrared and microwave radiation. Topics include: physical principles, including governing equations; imaging system geometries; radiometric corrections, including calibration and atmospheric correction; geometric corrections, including registration and land cover classification algorithms, including accuracy assessment and geospatial data integration.

Prerequisites: Engineering 335, Geomatics Engineering 351 and one of Physics 269 or 369.

Geomatics Engineering 455 **H(3-3)**

Cadastral Surveys and Land Registration Systems

The role of the professional land surveyor. The Dominion Lands Survey System and Land Surveys Acts and Regulations. Cadastral surveys, including surveys of Canada Lands for aboriginal land claims and coastal boundaries. Land registration systems in Western Canada.

Prerequisites: Geomatics Engineering 343 and 421.

Geomatics Engineering 500 **F(0-6)**

Geomatics Engineering Project

Group project, under the supervision of a faculty member, on an assigned Geomatics Engineering topic. The project will normally involve a literature review, theoretical work, and laboratory or field work. Submission and defence of progress reports and a final report are required.

Prerequisites or Corequisites: Communications Studies 363 and Geomatics Engineering 501.

Geomatics Engineering 501 **H(152 hours)**

Field Surveys

Field exercises include: instrument familiarization, highway design and construction survey, boundary survey problems, astronomic azimuth, precise engineering survey, geodetic control survey, satellite surveys. Emphasis is placed on practical and professional experience and students participate in organizational, planning, scheduling, and logistical aspects of field operations. In addition

to group field reports on each exercise, each student is required to prepare a complete report on one selected major exercise. In addition there will be a two day series of seminars and case studies on the practice and profession of Land Surveying.

Prerequisites: All third year courses or consent of the Department Head.

Note: A two-week field camp will be held at the Kananaskis Centre for Environmental Research Field Station prior to the start of the Fall Session lectures.

Geomatics Engineering 545 H(2-2)
(formerly Geomatics Engineering 445)

Hydrography

Elements of oceanography, tides and water levels, principle of underwater acoustics. Fundamental of RF and acoustic propagation. Marine positioning; shore-based and satellite-based radionavigation systems, optical methods, dead reckoning systems, underwater positioning, integrated positioning systems. Depth determination: shipborne echo-sounding and mechanical methods, airborne laser and electromagnetic methods, related corrections.

Prerequisites: Geomatics Engineering 361 and 423.

Geomatics Engineering 557 H(2-2)
(formerly Geomatics Engineering 459)

Design and Implementation of Geospatial Information Systems

Overview of Geospatial Information Systems (GIS). Map projection systems (cylindrical, conical and azimuthal projections) and coordinate systems with an emphasis on conformal mapping such as UTM. Discrete georeferencing including address matching. Spatial data management. GIS data models and structures. Spatial indexing. Algorithms for data manipulation, transformation. Spatial analysis and visualization. Strategies and steps on GIS design and implementation. Data standards and metadata management. Group projects.

Prerequisite: Geomatics Engineering 351.

Geomatics Engineering 559 H(2-2)
(formerly Geomatics Engineering 433)

Digital Imaging and Applications

An introduction to digital image processing (IP) and computer vision (CV) concepts, methods and algorithms which will enable the students to implement IP/CV systems or use IP/CV software with emphasis on remote-sensing and photogrammetry applications and problem solving. Course components include: digital image acquisition and sampling, image enhancement and restoration, image segmentation, and introduction to image compression.

Prerequisites: Electrical Engineering 327 and Geomatics Engineering 435.

Geomatics Engineering 561 H(2-2)

Satellite Positioning

Description of GPS signal structure and derivation of observables. Characteristics of instrumentation. Analysis of atmospheric, orbital and other random and non-random effects. Derivation of mathematical models used for absolute and differential static and kinematic positioning. Pre-analysis methods and applications. Software considerations. Introduction to GPS quality control. Static and kinematic survey procedures and operational aspects. Introduction to integrated GPS-INS systems.

Prerequisites: Geomatics Engineering 343 and 423.

Prerequisite or Corequisite: Geomatics Engineering 419.

Geomatics Engineering 563 H(2-2)
(formerly Geomatics Engineering 461)

Data Analysis in Engineering

Fundamental of matrix theory, linear systems, probability and statistics. Data classification, analysis and bias identification. Random data acquisition, qualification and analysis. Least squares estimation and data analysis. Random process, stationarity test and kinematic modelling. Kalman filtering and real-time data analysis. Introduction to signal processing and time series analysis. Practical applications of data analysis and processing in geomatics engineering.

Prerequisite: Geomatics Engineering 361.

Geomatics Engineering 567 H(2-2)

High-Precision Surveys

Instrument systems and procedures for high-precision surveys: precise levels, high-precision theodolites, electronic distance measurement instruments. High-precision industrial surveys: computation of three-dimensional orientations and rotations by autoreflection and autocollimation; computation of three-dimensional coordinates and coordinate changes by theodolite intersection methods, total station methods, scale bar on target methods, digital camera methods, laser scanner methods; systematic errors and their control; geometric form fitting.

Prerequisites: Geomatics Engineering 343 and 361.

Geomatics Engineering 573 H(2-2)

Digital Terrain Modelling

Digital Terrain Modelling (DTM, DEM, DHM, DTEM) concepts and their implementation and applications in geomatics engineering and other disciplines. Emphasis will be on mathematical techniques used in the acquisition (e.g. photogrammetric data capture, digitized cartographic data sources capturing, other methods: IFSAR, and laser altimeters) processing, storage, manipulation, and applications of DTM. Models of DTM (Grids, Contours, and TINS). Surface representation from point data using moving averages, linear projection, and Kriging techniques. Grid resampling methods and search algorithms used in gridding and interpolation. DTM derivatives (slope maps, aspect maps, viewsheds, and watershed). Applications of DTM in volume computation, orthophotos and drainage networks.

Prerequisites: Engineering 407 and Geomatics Engineering 431.

Geomatics Engineering 579 H(2-2)

Survey Law

Regulatory reform. Evidence of boundaries. Riparian rights. Title to land. Multi-purpose cadastre. Aboriginal title. Cadastral reform.

Prerequisite: Geomatics Engineering 455.

Geomatics Engineering 581 H(2-2)

Land Use Planning

Subdivision planning. Land ethics. Sustainable development. Provincial and municipal requirements. Pattern usage design. Site assessments. Impact assessments.

Prerequisite: Geomatics Engineering 455.

Geomatics Engineering 583 H(2-2)

Environmental Modelling

The application of geomatics technology for the monitoring, modelling, and mitigation of environmental engineering problems. Earth systems modelling, climate change, and the general impacts of anthropogenic activity are investigated. Water quantity and quality issues; inland, costal, and ocean environments; and atmospheric and land-based processes are presented with applications of how geomatics technology supports monitoring and modelling efforts.

Prerequisites: Geomatics Engineering 435 and 459.

Graduate Courses

Following are the Graduate Courses normally offered in the Department. Additional courses are also offered by visiting international lecturers. Please refer to the Department web site (http://www.geomatics.ucalgary.ca) for current course listings.

Geomatics Engineering 601 H(0-4)

Graduate Project I

Individual project in the student's area of specialization under the guidance of the student's supervisor. A written proposal, one or more written progress reports, and a final written report are required. An oral presentation is required upon completion of the course.

Note: Open only to students in the course-only route MEng.

Geomatics Engineering 603 H(0-4)

Graduate Project II

Individual project in an area other than the student's area of specialization under the guidance of a faculty member other than the student's supervisor. A written proposal, one or more written progress reports, and a final written report are required. An oral presentation is required upon completion of the course.

Note: Open only to students in the course-only route MEng.

Geomatics Engineering 605 Q(0-1S)

Research Seminar I

Seminar presentation of studies in the literature or of current research.

Note: Compulsory for all MSc graduate students.

NOT INCLUDED IN GPA

Geomatics Engineering 607 Q(0-1S)

Research Seminar II

Seminar presentation of studies related to the student's current research. Students are required to attend a fixed number of seminars and give one presentation. Should not normally be taken in the same term as Geomatics Engineering 609.

Note: Compulsory for all PhD graduate students.

NOT INCLUDED IN GPA

Geomatics Engineering 609 Q(0-1S)

Research Seminar III

Seminar presentation of studies related to the student's current research. Students are required to attend a fixed number of seminars and give one presentation. Should not normally be taken in the same term as Geomatics Engineering 607.

Note: Compulsory for all PhD graduate students.

NOT INCLUDED IN GPA

Geomatics Engineering 613 H(3-0)

Geodetic Reference Systems

Overview of geodetic reference systems and required accuracies. Star catalogues for optical and radio observations. Very long baseline interferometry (VLBI) and applications. Satellite and lunar laser ranging systems and applications. Precession, nutation, polar motion, Earth rotation and related monitoring systems. Absolute and relative reference gravity networks. North American horizontal and vertical datums. Relationships between global supernetworks and national geodetic networks. Time variations and geodynamical aspects of geodetic reference systems. Current research activities.

Geomatics Engineering 615 H(3-0)

Advanced Physical Geodesy

Potential theory and godetic boundary value problems (GBVPs). Solution approaches to the Molodensky problem. Least-squares collocation (LSC). Hilbert spaces with kernel functions. Variational principles, improperly posed problems and regularization. The altimetry-gravimetry and overdetermined GBVPs. Solution of GBVPs by integral techniques, fast Fourier transforms and LSC. Use of heterogeneous data sets and noise propagation. Applications to gravity prediction, geoid determination, deflection estimation, satellite altimetry and airborne gravimetry and gradiometry. Current research activities.

Note: Not open to students with credit in Geomatics Engineering 611 or 617.

Geomatics Engineering 621 H(3-0)

State Models, Kalman Filtering and Smoothing

The state space approach to dynamic modelling, advantages and limitations. Models of geodetic measurement processes and empirical model identification. Linear dynamic systems, transition matrix, superposition integral, observability and controllability, error propagation. Examples from kinematic positioning. Discrete optimal linear filtering and smoothing. Kalman filter, UD factorization, SRIF algorithm. Fixed-interval and fixed-lag smoothers. Selected topics in nonlinear estimation. The extended Kalman filter. Filter design and sensitivity analysis with an example from inertial gravimetry. Implementation aspects, pitfalls and operational constraints. The use of filtered data in geodetic computations. Current research activities.

Geomatics Engineering 623 H(3-0)

Inertial Surveying and INS/GPS Integration

Principles of inertial positioning and inertial gravimetry; their relation to inertial navigation. Definition of an operational inertial frame. Inertial error models as perturbation solutions about a reference trajectory. State space formulation and the computation of the transition matrix. Real-time estimation using zero velocity updates; Kalman filtering and alternatives. Post-mission estimation, optimal and empirical smoothing, use of different observables. Existing inertial survey systems; new developments in strapdown technology. Practical aspects of inertial positioning and inertial gravimetry. INS/GPS integration. Current research activities.

Geomatics Engineering 625 H(3-2)

Navstar GPS: Theory and Applications

Overview of space positioning and navigation systems; concepts and general description. GPS signal description. Receiver and antenna characteristics and capabilities; GPS error sources and biases; atmospheric delays, signal reflection and countermeasures. Mathematical models for static point and relative positioning. Kinematic single point and differential post mission and real time positioning and navigation. Land, marine and airborne applications. Telemetry link requirements for differential positioning. GPS software.

Geomatics Engineering 629 H(3-0)

Advanced Estimation Methods and Analysis

Concepts of optimal estimation and different optimization criteria. Review of standard cases of least squares adjustments. Development of the Kalman filter equations. Relationships among Kalman, Bayes sequential and phase expressions. Least squares collocation and its relationship to ordinary adjustments. Robust estimation and analysis. Error analysis and advanced statistical testing. Applications to geomatics engineering problems.

Geomatics Engineering 631 H(3S-0)

Seminars in Remote Sensing Applications

A seminar series which will look at current research in remote sensing applications. Students must choose a particular application area which may include forestry, soil, water quality, sea surface temperature, glaciology vegetation stress, grasslands, sea ice, etc. The course entails the preparation and delivery of four seminars ranging in duration from 20 to 50 minutes and the preparation of a written literature review. Students from outside of geomatics engineering are encouraged to enroll.

Geomatics Engineering 633 H(3-0)

Atmospheric Effects on Satellite Navigation Systems

Theoretical and observed aspects of radio wave propagation in the ionosphere and troposphere, with an emphasis on L-band (GPS) signals. Fundamentals of absorption, attenuation, depolarization, and defraction will be covered, in addition to characteristics and physical properties of the propagation medium and atmospheric constituents. The impact of such effects, and methods of mitigation, will be interpreted with respect to satellite navigation applications.

Geomatics Engineering 635 H(3-0)

Non-Topographical Photogrammetry

Data acquisition systems employed in non-topographical photogrammetry: metric and non-metric cameras, and non-conventional imagery. Close-range photogrammetric system calibration: mathematical formulation, self-calibration and image geometry factors. Analytical and digital approaches in data reduction, with emphasis on the bundle and Direct Linear Transformation-type methods. Photogrammetric network design and post-adjustment analysis. Overview of current applications, including engineering, x-ray, medical and industrial photogrammetry. Selected case studies.

Geomatics Engineering 639 H(3-0)

Digital Stereo Image Processing

Design characteristics of digital imaging devices for metric data capture. Comparison of various systems: electronic scanners, solid-state scanners and electro-optical scanners. Calibration and geometric distortion modelling. Image enhancement techniques and operators. Correlation techniques: electronic correlation, digital correlation and coherent optical correlation. Applications to manufacturing and robotics.

Geomatics Engineering 643 H(3-0)

Industrial and Precision Alignment Surveys

Special methods and equipment for positioning, alignment, or deformation monitoring of machinery. Integration of machinery vibration measurements with machinery deformation measurements.

Geomatics Engineering 651 H(3-0)

Case Studies in Land Information Systems

Analysis and evaluation of the basic features of an LIS. Concepts of information, gridding considerations and georeferencing. Systems aspects: computer hardware and software, systems analysis and design, data base models (logical and physical), data communications technology (on-line and distributed systems). Data concepts: digital data collection and mapping, data organization and processing, data types, geometric relations and operations, computational geometry, input/output operations. Review and discussion of some major LISs, with emphasis on practical considerations and cost benefit involved in the development of large-scale systems.

Geomatics Engineering 653 H(3-0)

Digital Terrain Modelling and Applications

Global and local modelling strategies for topography. Elements of spatial topology and geomorphology. Breaklines, trends, periodicities and related features. Sampling techniques and accuracy considerations. Triangulations, tessellations and other partitions. Contouring, shading and other graphical representations. Network modelling approaches of Werner and Warntz. Graph theoretic approach of Pfaltz. Contour trees and generalizations. Surface patchwork intelligent approach. Fractals and applications. Overview of data structures. Current research activities.

Geomatics Engineering 655 H(3-0)

Advanced Remote Sensing

Advanced techniques for analysis and interpretation of remotely sensed imagery, with emphasis on data acquired from satellite and airborne platforms. Topics include: review of physical principles, including governing equations; imaging system geometries; radiometric corrections, including calibration and atmospheric correction; spatial filtering for noise removal and information extraction; geometric corrections, including rectification and registration; geophysical algorithms such as leaf area index and biomass and land cover classification algorithms.

Geomatics Engineering 661 H(3-0)

Advanced Spatial Information Systems

Principles of advanced spatial information systems. Topological modelling and spatial data representations. Automated data sources and integration of remote sensing. Data quality and uncertainty. Advanced spatial data handling methods and algorithms. Spatial database management including relational databases, object-relational databases and object-oriented databases. Data warehousing and data mining. Open GIS and distributed GIS issues. Spatial data standards and meta data management.

Geomatics Engineering 663 H(3-0)

Satellite Altimetry and Applications

Overview of satellite altimetry missions, achieve-

ments and potentials. Altimeter measurement analysis technology and specifications. Orbit determination with ground tracking and perturbation analysis. Altimetry profile data processing, regularization and gridding. Sea surface topography, ocean and coastal geoid modelling. Inversion for gravity and mass anomalies. Ocean and related monitoring applications. Geodetic, global change and geophysical exploration applications. Current research activities.

Geomatics Engineering 665 **H(3-0)**

Advanced Survey Law

A case study approach involving the investigation, discussion and analysis of legislation and judicial decisions relating to cadastral subject areas, including land boundary law; survey evidence; coastal and inland water boundaries; offshore oil and gas lease surveys; land titles and registration of deeds systems; adverse possession and prescription; conventional boundaries; the settlement of boundary disputes; land use planning and development; aboriginal land claims; professional responsibility and liability; copyright.

Geomatics Engineering 681 (Geophysics 681) **H(3-0)**

Advanced Global Geophysics and Geodynamics

Elasticity, figure of the Earth, Earth structure and seismology, gravity and its temporal variations, isostasy, tides, Earth rotation and orientation, time, plate flexure, glacial rebound, continental drift, geodetic observation methods for geodynamics.

Note: Not open to students with credit in Geophysics 655.

Geomatics Engineering 699 **H(3-0)**

Special Studies

Focus on advanced studies in specialized topics. Students may also conduct individual studies under the direction of a faculty member.

MAY BE REPEATED FOR CREDIT

Geophysics GOPH

Instruction offered by members of the Department of Geology and Geophysics in the Faculty of Science.

Department Head – L. R. Lines

Senior Courses

Geophysics 355 **H(3-3)**

Exploration Geophysics

An introduction to refraction seismic, reflection seismic, gravity and magnetic methods applied to exploration for hydrocarbons, and their use in engineering studies.

Prerequisites: Geology 201; Mathematics 251 or 249 or Applied Mathematics 217; Physics 223.

Note: Credit for both Geophysics 355 and 365 will not be allowed.

Geophysics 359 **H(3-3)**

Global Geophysics

Earthquake seismology, gravity, the geoid, geomagnetism, paleomagnetism and geodynamics, heat flow, radioactivity and geochronology. Applications to global tectonics and deep structural investigations.

Prerequisites: Geophysics 355 and one of Mathematics 253 or 263.

Geophysics 365 **H(3-3)**

Environmental Geophysics

Methods for the determination of the composition and structure of shallow subsurface materials, including refraction seismic, high resolution reflection seismic, direct current resistivity, induced polarization (IP), low induction number electromagnetic profiling and depth sounding, ground penetrating radar, magnetics and microgravity.

Prerequisite: Applied Mathematics 217 or Mathematics 251 or 249

Note: Credit for both Geophysics 365 and 355 will not be allowed.

Note: Not available as a course in the Field of Geophysics.

Geophysics 375 **H(3-0)**

Natural Disasters and Critical Earth Phenomena

Causes of disasters such as earthquakes, tsunami, volcanic eruptions, mud flows, landslides, avalanches, flooding, tornadoes and hurricanes, and other critical phenomena such as sinkholes, ozone depletion and radiation, carbon dioxide and global warming, El Nino, toxic natural materials and pollution, and extraterrestrial impacts. Surveys of historic disasters and their effects on life on Earth. Methods of prediction and prevention of disasters and precautions for the mitigation of their effects. A substantial project with a written report will be required.

Note: A non-major course for students in all faculties. Not available as a course in the Field of Geophysics.

Geophysics 453 **H(3-3)**

Mining Geophysics

Electromagnetic, resistivity, induced polarization, self potential, radiometric and gravity methods applied to problems in the search for metallic mineral deposits.

Prerequisites: Geology 201; Physics 223; Mathematics 253 or 263 or Applied Mathematics 219; Mathematics 221 or Applied Mathematics 309 or Mathematics 353.

Geophysics 457 **H(3-3)**

Physical Properties of Rocks

Physical properties of minerals and rocks, their relationship to geophysical measurements and surveys.

Prerequisites: Geophysics 355, 359, Mathematics 331.

Geophysics 509 **H(0-9)**

Independent Study

Senior thesis. A written report based on independent study. Originality is emphasized, laboratory and field studies are encouraged. Published material may be included.

Prerequisites: Consent of the Department and of a Departmental faculty member who will act as a supervisor.

MAY BE REPEATED FOR CREDIT

Geophysics 547 **H(3-3)**

Gravity and Magnetics

The nature of the magnetic and gravitational fields of the earth. Theory and applications of the gravity and magnetic methods of geophysical exploration.

Prerequisites: Geophysics 359 and Mathematics 331.

Geophysics 549 (formerly Geophysics 459) **H(0-1T-96 hours)**

Field School

Seismic, gravity, magnetic, electromagnetic, resistivity, induced polarization and topographic surveys will be conducted for about 12 days prior to Labour Day. Data collected will be processed during Fall Session tutorials.

Prerequisites: Geophysics 355, 453, Geology 341.

Note: This course occurs in rugged field conditions and varying weather, for which participants must be prepared and equipped.

Geophysics 551 **H(3-3)**

Seismic Theory and Methods

Seismic wave propagation theory; various techniques of exploration seismology.

Prerequisites: Geophysics 355, Physics 321, 323, Applied Mathematics 415, and Mathematics 331.

Geophysics 557 **H(3-3)**

Geophysical Data Processing

Geophysical signal analysis, digital processing methods applied to seismic and other geophysical data.

Prerequisites: Applied Mathematics 415, Geophysics 355.

Geophysics 559 **H(3-3)**

Geophysical Interpretation

Analysis and integration of geophysical and geological data. Qualitative and quantitative interpretation. Industrial case studies.

Prerequisite: Geophysics 355.

Graduate Courses

Graduate students are urged to read the Geology and Geophysics Department section in the Graduate Studies calendar. Only where appropriate to a student's program may graduate credit be received for courses numbered 500-599. Courses numbered 600 are available to fourth-year students who obtain Departmental approval and who have credit for the prerequisite courses.

Geophysics 645 **H(3-0)**

Seismic Wave Propagation

Seismic body and surface waves, reflection, refraction, diffraction, anelasticity, anisotropy, ray methods, point and line source solutions to the equation of motion, finite-difference and finite-element methods for seismic waves, additional topics depending on current research interests.

Prerequisite: Geophysics 551 or consent of the Department.

Geophysics 647 **H(3-0)**

Advanced Applied Geophysics

Selected modern topics in seismic, gravity, electrical and magnetic data acquisition, processing, and interpretation.

Geophysics 653 **H(3-0)**

Electromagnetic and Induced Polarization Topics

Topics in electromagnetic and induced polarization exploration as applied to the search for metallic minerals.

Note: Credit for both Geophysics 653 and 553 will not be allowed.

Geophysics 657 **H(3-0)**

Seismic Signal Analysis

Advanced methods of seismic data analysis in exploration and production geophysics. Topics include velocity analysis, polarization filtering, median filtering, migration, inversion and tomography.

Geophysics 659 **H(3-0)**

Practical Seismic Modeling, Migration, and Inversion

Concepts and techniques of seismic imaging (migration) are explored. Practical considerations such as algorithm characteristics and data geometry are emphasized; poststack and prestack migration and DMO methods are examined from the Kirchhoff, Fourier, and downward continuation perspectives.

Note: Some familiarity with seismic data and computer programming is assumed.

Geophysics 665 **H(3-0)**

Theoretical Seismology

A continuation of topics covered in Geophysics 645, inverse theory, additional topics depending on current research interests.

Prerequisite: Geophysics 645 or consent of the Department.

Geophysics 667 **H(3-3)**

Digital Signal Theory and Applications

The theory of digitally sampled signals in one, two, and three dimensions, fundamental sampling theorems, reconstruction formulae, Z transforms, filtering are developed and used to solve problems in wave propagation, seismic imaging, geophysical inverse theory, and potential fields processing. The methods of Green's functions, separation of variables, and finite differences are emphasized.

Geophysics 681 **H(3-0)**
(Geomatics Engineering 681)

Advanced Global Geophysics and Geodynamics

Elasticity, figure of the Earth, Earth structure and seismology, gravity and its temporal variations, isostasy, tides, Earth rotation and orientation, time, plate flexure, glacial rebound, continental drift, geodetic observation methods for geodynamics.

Note: Not open to students with credit in Geophysics 655.

Geophysics 683 **H(3-0)**

Dynamics of the Earth

Fluid mechanics and Earth rheology, heat flow and mantle convection, magneto hydrodynamics and core dynamics, stresses, folding and diapirism, faulting and earthquake mechanism.

Note: Not open to students with credit in Geophysics 651.

Geophysics 685 **H(3-3)**

Seismic Anisotropy

Theory of elastic-wave propagation in anisotropic media of various symmetries; the Kelvin-Christoffel equations; group and phase velocities; slowness, velocity and wave surfaces; shear-wave splitting; singularities; scaled physical modelling in anisotropic media; results of field studies in surface-seismic, VSP and cross-borehole modes; anisotropy in the deep interior of the Earth.

Prerequisite: Geophysics 645 or consent of the Department.

Geophysics 687 **H(3-3)**

Theory of Seismic Imaging

The theories of wave propagation in acoustic and elastic media are used to develop the major algorithms used in seismic imaging (migration). Green's theorem, Huygen's principle, Kirchhoff diffraction theory, raytracing, wavetracking, multidimensional Fourier analysis, and Radon transforms are explored.

Note: Credit for both Geophysics 699.04 and 687 will not be allowed.

Note: Elementary knowledge of vector calculus and partial differential equations is assumed.

Geophysics 699 **H(3-3)**

Selected Topics in Geophysics

Courses are offered in specific topics in areas such as seismology, environmental geophysics, potential methods, integrated geophysical studies, and geodynamics.

MAY BE REPEATED FOR CREDIT

Geophysics 701 **H(0-6)**

Advanced Independent Study

A written report based on laboratory and field studies is required.

Note: Open only to graduate students in the Department of Geology and Geophysics.

Geophysics 703 **H(0-6)**

Readings in Geophysics

Note: Open only to graduate students in the Department of Geology and Geophysics.

German GERM

Instruction offered by members of the Department of Germanic, Slavic and East Asian Studies in the Faculty of Humanities.

Department Head – Z-J. Yang

Note: German 317 and 359 are given in English and no knowledge of German is required. These courses do not count as prerequisites to other senior German courses.

Note: Consent of the Department can be received in lieu of a stated prerequisite when equivalent knowledge can be demonstrated.

Junior Courses

German 201 **H(1-1T-1)**

Introduction to German Studies

Selected phenomena of German culture, including historical dimensions, factors influencing cross-cultural encounters. Basic structures of German language, practice with familiar communicative situations, and development of reading skills.

Note: Not open to students with credit in German 205 or 305. May not be taken for credit by students with German 30 or 31.

German 203 **H(3-1)**

German I

The first semester of a three-semester sequence, this course combines intensive four-skills language learning with the study of German culture.

Prerequisite: German 201.

Note: Credit for both German 203 and either 213 or 305 will not be allowed.

German 213 **H(3-0)**

Reading German

General strategies for the decoding of texts. Specific strategies and skills for understanding the content of moderately difficult texts with diverse content, discourse styles, and from a variety of disciplines. This course is delivered by computer.

Prerequisite: German 201.

Note: Not open to students with credit in German 203, 205, 221, 223, 305 or 307.

German 221 **H(3-1)**

Beyond High School German I

Review and further acquisition of the principal elements of Modern German within a first-year university context.

Prerequisite: German 30.

Note: Not open to students with credit in German 201, 203, 213, 225, 227, 301, or 303.

German 223 **H(3-1)**

Beyond High School German II

A continuation of German 221.

Prerequisite: German 221.

Note: Not open to students with credit in German 201, 203, 225, 227, 301, or 303.

Note: German majors and minors are advised to take German 315 concurrently with German 223.

Senior Courses

German 301 **H(3-1)**

German II

A continuation of German 203.

Prerequisite: German 203 or 207.

German 303 **H(3-1)**

German III

A continuation of German 301.

Prerequisite: German 301.

Note: Not open to students with credit in German 221, 223, 225, or 227.

Note: German majors and minors are strongly advised to take German 315 concurrently with German 303.

German 315 **H(3-0)**

Challenging the German Text

Study of authentic German texts of various types

(e.g. literary, journalistic, informational) with goal of improving reading comprehension and textual analysis skills. Practice in articulating abstract and complex ideas orally and in writing.

Prerequisite: German 221, 225, or 301.

Note: Recommended for all majors and minors, concurrently with German 303 or 223 if possible.

German 317 **H(3-0)**

German Civilization

Distinctive features of German civilization within a historical context.

Note: This course is taught in English; no knowledge of German is required.

German 331 **H(3-0)**

Consolidating German I

Consolidation of previous language acquisition through targeted review. Development of increased sophistication in language production and cultural understanding

Prerequisite: German 223, 227 or 303.

Note: German majors are strongly advised to take German 349 concurrently with 331.

German 333 **H(3-0)**

Consolidating German II

A continuation of German 331.

Prerequisite: German 331.

German 349 **H(3-0)**

Foundations for Research in German

Introduction to research questions and research methods in German studies through case-study application.

Prerequisite: German 223, 227 or 303.

Note: Not open to students with credit in German 351.

Note: Compulsory for all German majors and minors, ideally taken together with German 331.

German 353 **H(3-0)**

Linguistics for German

Further development of structural understanding of the German language through linguistics. Introduction to linguistic analysis.

Prerequisite: German 331.

Note: Not open to students with credit in German 335.

Note: Recommended for all German majors.

German 357 **H(3-0)**

Topics in German Film

German film from the perspectives of film theory and political and cultural history culture. May concentrate on a specific director, a period, or a genre in German film.

Note: This course is taught in English; no knowledge of German is required.

MAY BE REPEATED FOR CREDIT

German 359 **H(3-0)**

German Literature in Translation

Study of literary texts within the rich tradition of Germany's Dichter und Denker (poets and philosophers).

Note: This course is taught in English; no knowledge of German is required.

MAY BE REPEATED FOR CREDIT

German 369 **H(3-0)**

Topics in German Literature

Selected works of German literature studied within cultural context. Focus of course (themes, genres, authors, periods) will vary as determined by instructor.

Prerequisite: German 349. German 315 is strongly recommended.

MAY BE REPEATED FOR CREDIT

German 397 **H(3-0)**

Inter-Cultural Immersion Experience I

Independent study course. Project with inter-cultural theme, derived from an immersion experience, most likely abroad.

Prerequisite: Departmental permission MUST be be obtained before embarking on the immersion experience or enrolling in this course.

NOT INCLUDED IN GPA

German 401 **H(3-0)**
(formerly German 411)

Advanced Language Practicum

Students will expand and refine their German language skills as well as their competencies in cross-cultural communication through extensive practical translation work.

Prerequisite: German 333.

German 403 **H(3-0)**
(formerly German 493)

Senior Projects in Language

Students will integrate theory and practice in the use of German through a variety of class projects. Designed to increase overall linguistic and intercultural competence.

Prerequisite: German 401.

MAY BE REPEATED FOR CREDIT

German 451 **H(3-0)**

Cross-Cultural Explorations

Cross-cultural comparison of events, cultural patterns, historical periods, or social movements which find a parallel in more than one of the cultural traditions represented in the Department. The language of instruction is English.

MAY BE REPEATED FOR CREDIT

German 469 **H(3-0)**

Selected Topics in German Literature and Linguistics

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

German 497 **H(3-0)**

Inter-Cultural Immersion Experience II

Independent study course. Project with Inter-cultural theme, derived from an immersion experience at an advanced level, most likely abroad.

Prerequisite: Departmental permission MUST be be obtained before embarking on the immersion experience or enrolling in this course.

NOT INCLUDED IN GPA

German 551 **H(3-0)**

Independent Study

Research project developed in consultation with and under supervision of instructor.

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

German 561 **H(3-0)**

Research Seminar

Centered around a professor's current research project, the course will engage senior students as members of a collaborative research team. Independent research, discussion, group presentations.

Prerequisites: At least one half-course equivalent in German 469 and consent of the Department.

MAY BE REPEATED FOR CREDIT

German 591 **H(0-3T)**

Honours Project

The Honours project for Honours students in their final year.

Prerequisite: Consent of the Department.

German 599 **H(3-0)**

German Studies Capstone

Integration and development of knowledge and insights relating to German culture and cross-cultural experiences. Research, discussion, and departmental presentation of a topic within a specified theme.

Prerequisite: Consent of the Department.

Graduate Courses

(Only where appropriate to a student's program may graduate credit be received for courses numbered 500-599.)

German 627 **H(3-0)**

Seminar in German Literature

Selected topics in literary history.

MAY BE REPEATED FOR CREDIT

German 629 **H(3-0)**

Seminar in German Language

German 631 **H(3-0)**

Theory and Methods of German Language Teaching

German 633 **H(3-0)**

Bibliography and Research Methods

German 699 **H(3-0)**

Conference Course

Meets the needs of individual students. It may include a general or specific linguistic topic; or the detailed study of an author, period, genre; or any literary problem not dealt with in the honours or Graduate Courses listed above.

Greek GREK

Instruction offered by members of the Department of Greek and Roman Studies in the Faculty of Humanities.

Department Head – P. Toohey

Note: For courses on Greek Literature in translation, Greek History, Art, Archaeology, etc., see Greek and Roman Studies (GRST).

Note on Course Sequence and Prerequisites: The normal sequence is Greek 201, 203, 301, 303, 401 and/or 413, 525. Enrollment in any higher level Greek course requires a grade of at least "C-" in the prerequisite course(s), or consent of the Department. Greek 333, 433, 453, and 551 are supplementary courses.

Junior Courses

Greek 201 **H(3-2T)**

Ancient Greek I

This course for beginners provides the first steps towards reading classical and New Testament Greek texts.

Greek 203 **H(3-2T)**

Ancient Greek II

Continuation of Greek 201.

Prerequisite: Greek 201 or consent of the Department.

Senior Courses

Greek 301 **H(3-1T)**

Ancient Greek III

Completes the study of basic grammar, vocabulary and translation skills.

Prerequisite: Greek 203 or consent of the Department.

Greek 303 **H(3-0)**

Intermediate Readings in Classical and New Testament Greek

Prerequisite: Greek 301 or consent of the Department.

Greek 333 **Q(0-2T)**

Second-Year Supplementary Study

Supplementary work in language and translation skills.

Prerequisite or Corequisite: Greek 303.

Greek 401 **H(3-0)**

Third-Year Readings I

Readings will normally be selected from classical texts.

Prerequisite: Greek 303 or consent of the Department.

Greek 413 **H(3-0)**

Third-Year Readings II

Readings will normally be selected from texts of the Early Christian era.

Prerequisite: Greek 303 or consent of the Department.

Greek 433 **Q(0-2T)**

Third-Year Supplementary Study I

Prerequisite or Corequisite: Greek 401 or 413.

Greek 453 **Q(0-2T)**

Third-Year Supplementary Study II

Prerequisite or Corequisite: Greek 401 or 413.

Greek 525 **H(3S-0)**

Topics in Greek Literature and Language

Prerequisite: Greek 401 or 413.

MAY BE REPEATED FOR CREDIT

Greek 551 **H(0-2T)**

Directed Studies in Greek Literature and Language

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Graduate Course

Greek 601 **H(3S-0)**

Graduate Seminar

MAY BE REPEATED FOR CREDIT

Greek and Roman Studies GRST

Instruction offered by members of the Department of Greek and Roman Studies in the Faculty of Humanities

Department Head – P. Toohey

For courses in the ancient Greek and Latin languages see listings under Greek and Latin.

Note: Undergraduate Courses under this heading do not require any knowledge of Greek or Latin. Courses at both the 200 level (designed for first-year students) and 300 level are survey courses with no prerequisites. The research topics courses Greek and Roman Studies 413-457 do not have specific prerequisites, but students are strongly advised to have taken at least two 300-level Greek and Roman Studies courses with grades of at least "C-" before enrolling in them.

Junior Courses

Greek and Roman Studies 205 (formerly Ancient History 209) **H(3-0)**

Introduction to Greece and Rome

A historical survey from the 8th century BCE to the 4th century CE.

Greek and Roman Studies 209 (formerly Classical Studies 209) **H(3-0)**

Classical Mythology and Literature

An introduction to Greek and Roman myths as presented in classical literature and art, and to their cultural context.

Greek and Roman Studies 211 (formerly Classical Studies 211) **H(1-2)**

Technical Terms of Medicine and the Life Sciences

The Greek and Latin elements of modern medical and life-sciences terminology, with a brief introduction to their history and cultural background.

Greek and Roman Studies 231 **H(1-2S)**

Encounters with the Ancient World

Designed for those who intend to major in Humanities. Offers a challenging introduction to the ancient world through study, research and writing on some of its key historical developments and distinctive achievements. Focuses and topics will vary according to the instructor's choice and will be specified in each Course Outline.

Senior Courses

Greek and Roman Studies 305 (Religious Studies 305) (formerly Classical Studies 305) **H(3-0)**

Greek and Roman Religion

A survey of religious beliefs and practices in the pre-Christian Greek and Roman World.

Prerequisite: One of Greek and Roman Studies 205, 209, Religious Studies 201, 205, or 273, or consent of the Department.

Greek and Roman Studies 315 (formerly Classical Studies 335) **H(3-0)**

Women and the Family in the Greek and Roman World

A survey of the lives, social roles and representations of women based on documentary evidence, literature and art. Emphases may vary from session to session.

Greek and Roman Studies 321 (formerly Classical Studies 221) **H(3-0)**

Ancient Technology

A survey of major technologies in antiquity (metallurgy, agriculture, hydraulics, pottery, textiles, transportation, writing, construction) with special emphasis on the technological achievements of the Bronze Age and the cultures of Greece and Rome.

Greek and Roman Studies 325 (formerly Classical Studies 345) **H(3-0)**

Greek Art and Architecture

A survey of Greek art and architecture from the Bronze Age to the Hellenistic period.

Greek and Roman Studies 327 (formerly Classical Studies 347) **H(3-0**

Roman Art and Architecture

A survey of Roman art and architecture from the Etruscans to the beginning of the Christian Empire.

Greek and Roman Studies 335 (formerly Ancient History 335) **H(3-0)**

The Ancient Near East to Alexander the Great

History of the Near East from the 10th to the 4th century BCE.

Greek and Roman Studies 337 **H(3-0)**

(formerly Ancient History 337)

Early Greece

Early Greece from the late Bronze Age to the Persian Wars.

Note: This course is acceptable for credit towards a Major in History (subject to History program regulations).

Greek and Roman Studies 339 H(3-0)
(formerly Ancient History 339)

History of Classical Greece

History of the Greek world from the Persian Wars to the conquests of Alexander the Great.

Note: This course is acceptable for credit towards a Major in History (subject to History program regulations).

Greek and Roman Studies 341 H(3-0)
(formerly Ancient History 341)

History of the Mediterranean World 323 to 30 BCE

The Hellenistic world and the expansion of the Roman Empire to the time of Augustus.

Note: This course is acceptable for credit towards a Major in History (subject to History program regulations).

Greek and Roman Studies 345 H(3-0)
(formerly Ancient History 345)

Rome: The Late Republic and Early Empire

History of Rome from 133 BCE to 180 CE.

Note: This course is acceptable for credit towards a Major in History (subject to History program regulations).

Greek and Roman Studies 347 H(3-0)
(formerly Ancient History 347)

Late Roman Antiquity

History of the Roman and Byzantine world from 180 to 565 CE.

Note: This course is acceptable for credit towards a Major in History (subject to History program regulations).

Greek and Roman Studies 349 H(3-0)
(formerly Ancient History 349)

The Byzantine Empire

History of the Byzantine world from Justinian to the Sack of Constantinople in 1204.

Note: This course is acceptable for credit towards a Major in History (subject to History program regulations).

Greek and Roman Studies 355 H(3-0)
(formerly Classical Studies 355)

Greek Poetry and Drama in Translation

A survey of Greek poetic literature from Homer to the Hellenistic Period.

Greek and Roman Studies 357 H(3-0)
(formerly Classical Studies 357)

Latin Poetry and Drama in Translation

A survey of Latin poetic literature from its beginnings to the 2nd century CE.

Greek and Roman Studies 413 H(2-1S)

Topics in Early and Classical Greek History

Topics will reflect developments in current research, will vary from session to session, and will be announced in advance.

Greek and Roman Studies 415 H(2-1S)

Topics in Hellenistic and Roman Republican History

Topics will reflect developments in current research, will vary from session to session, and will be announced in advance.

Greek and Roman Studies 417 H(2-1S)

Topics in the History of the Roman Empire

Topics will reflect developments in current research, will vary from session to session, and will be announced in advance.

Greek and Roman Studies 419 H(2-1S)

Topics in Late Antiquity

Topics will reflect developments in current research, will vary from session to session, and will be announced in advance.

Greek and Roman Studies 421 H(2-1S)

Topics in Greek and Roman Political and Military History

Topics will reflect developments in current research, will vary from session to session, and will be announced in advance.

Greek and Roman Studies 423 H(2-1S)

Topics in Greek and Roman Social and Economic History

Topics will reflect developments in current research, will vary from session to session, and will be announced in advance.

Greek and Roman Studies 425 H(2-1S)

Greeks, Romans and Other Cultures: Selected Topics

Topics will reflect developments in current research, will vary from session to session, and will be announced in advance.

Greek and Roman Studies 431 H(2-1S)
(formerly Classical Studies 431)

Studies in Ancient Myths

Studies in the nature and functions of myth in ancient Greek and Roman culture and society. Topics will reflect developments in current research, will vary from session to session, and will be announced in advance.

Prerequisite: Greek and Roman Studies 209 or consent of the Department.

Greek and Roman Studies 433 H(2-1S)

Topics in Greek and Roman Religion and Intellectual History

Topics will reflect developments in current research, will vary from session to session, and will be announced in advance.

Greek and Roman Studies 445 H(2-1S)

Topics in Greek Art and Archaeology

Topics will reflect developments in current research, will vary from session to session, and will be announced in advance.

Greek and Roman Studies 447 H(2-1S)

Topics in Roman Art and Archaeology

Topics will reflect developments in current research, will vary from session to session, and will be announced in advance.

Greek and Roman Studies 455 H(2-1S)
(formerly Classical Studies 455)

Topics in Greek Literature in Translation

Topics will reflect developments in current research, will vary from session to session, and will be announced in advance.

Greek and Roman Studies 457 H(2-1S)
(formerly Classical Studies 457)

Topics in Latin Literature in Translation

Topics will reflect developments in current research, will vary from session to session, and will be announced in advance.

Greek and Roman Studies 481 Q(0-1)

Practicum

Provides students registered in one of the Department's major programs with credit for a quarter-course equivalent of program-related experiential learning through practical activities such as teaching, editing, publishing, translating, performances, exhibitions, museum work, conferences, information and website development, and campus, school and community programs. Projects must be designed in consultation with a departmental adviser. A written report and oral presentation are normally required.

Prerequisite: Consent of the Department.

NOT INCLUDED IN GPA

Greek and Roman Studies 483 H(0-2)

Practicum

Similar to Greek and Roman Studies 481 but provides a half-course credit for appropriate projects.

Prerequisite: Consent of the Department.

NOT INCLUDED IN GPA

Greek and Roman Studies 491 H(0-6)
(formerly Classical Studies 561)

Field Work

Provides credit, when transfer credit is not available, for a half-course equivalent of program-related study or field work in Europe or the Mediterranean area. Preliminary readings and a substantial report are normally required.

Prerequisite: Consent of the Department.

NOT INCLUDED IN GPA

Greek and Roman Studies 494 F(0-12)

Field Work

Similar to Greek and Roman Studies 491 but provides a full-course credit for appropriate projects.

Prerequisite: Consent of the Department.

NOT INCLUDED IN GPA

Greek and Roman Studies 525 **H(3S-0)**

Research Seminar

Research topics in Greek and Roman history, literature, art, and archaeology. Seminar discussions will require a high level of student participation.

MAY BE REPEATED FOR CREDIT

Greek and Roman Studies 551 **H(0-2T)**

Directed Research

Qualified students will undertake supervised research projects individually or in small groups.

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Graduate Courses

Only where appropriate to a student's program may graduate credit be received for courses numbered 601-607.

Greek and Roman Studies 601 **H(3S-0)**

Graduate Seminar

MAY BE REPEATED FOR CREDIT

Greek and Roman Studies 603 (formerly Classical Studies 603) **H(2S-0)**

Language Study and Research Techniques

NOT INCLUDED IN GPA

Greek and Roman Studies 605 (formerly Classical Studies 605) **H(0-2T)**

Research Survey and Bibliography

NOT INCLUDED IN GPA

Greek and Roman Studies 607 **Q(0-1T)**

Directed Studies

MAY BE REPEATED FOR CREDIT

Health and Society HSOC

Instruction offered by members of the Faculty of Medicine.

Contact – Bachelor of Health Sciences program office

Junior Course

Health and Society 201 **H(3-0)**

Introduction to Health and Society

A cross-cultural and historical introduction to definitions and models of health, disease, and illness. Introduction to basic concepts in population health: mortality, morbidity, incidence, prevalence, rates; examination of schemes for critical appraisal of scientific studies in the health sciences; an overview of areas of concentraiton in the field of Health and Society.

Senior Courses

Health and Society 301 **H(3-0)**

Determinants of Health

A broad based, interdisciplinary overview of models of the determinants of health. Includes an analysis of evidence of the relatived influence of environmental factors, health services, lifestyles and health behaviours, social and economic factors, biological predispositions, and a critical analysis of the mechanisms and power relations involved in the societal uptake of various conceptions.

Prerequisite or Corequisite: Health and Society 201.

Health and Society 311 **H(3-0)**

Health Services and Health Systems

Introduction to the health policy process, health care insurance, financing and delivery of health care, history of medicine, the legal basis for the Canadian health system, and public health, in international and historical perspective.

Prerequisite: Health and Society 201.

Health and Society 401 **H(3-0)**

Health Research Methods

Advanced study of methods from the social and life sciences as applied to health phenomena. Emphasis is placed on a critical analysis of the process of formulating research questions, designing studies appropriate to those questions, measuring variables, and evaluating and interpreting the results of research.

Prerequisites: Health and Society 301 and 311.

Health and Society 591 **H(3-0)**

Advanced Seminar in Health and Society

An advanced seminar involving critical analysis of contemporary health issues. Topics vary from year-to-year, but are always drawn from the current academic literature, from the public policy arena, and/or from the popular media.

Prerequisites: Health and Society 401 and registration in the BHSc Honours Health and Society major.

Hindi HNDI

Instruction offered by members of the Faculty of Humanities.

Junior Course

Hindi 205 **H(3-1)**

Beginners' Hindi I

Reading and writing of the alphabet in script, essentials of grammar, basic vocabulary, patterns of words, phrases and sentences, reading and translation of simple sentences.

Note: Hindi-speaking students must consult with the Instructor to be placed in a course corresponding to their ability.

Historical Studies HTST

Instruction offered by members of the Department of History in the Faculty of Social Sciences.

Department Head – D.B. Marshall

Junior Courses

Historical Studies 201 **H(3-0)**

The History of Europe

Selected topics may include formation and breakdown of political structures: cultural, social, and technological continuity and change; development of religious and secular belief systems; interactions among cultures. Course content will vary each session. Please consult the History Department for more specific information.

Historical Studies 205 **H(3-0)**

Encounters in History

Selected topics may include formation and breakdown of political structures: development of societies, cultures, religious and secular belief systems; developments in technological science and economies, anywhere on earth. Course content will vary each session. Please consult the History Department for more specific information.

Historical Studies 207 **H(3-0)**

The History of the Americas

Thematic treatment of the history of the American continents, with special attention to multicultural encounters, the environment, immigration and migration, economic and labor systems, social structures, colonial and military rivalries, the frontiers of European settlement, nation-state formation, and revolutions.

Historical Studies 209 **H(3-0)**

The History of East Asia

Topics may include formation and breakdown of political systems, trading circuits, societies and their natural environments; the movements of peoples and ideas; interactions between cultures and states; secular and religious systems.

Historical Studies 211 **H(3-0)**

Canada: Origins to 1867

An introduction to the dynamic themes in early Canadian history. Special attention will be devoted to social, economic, and political development, White-Aboriginal relations and the settlement of the Maritimes and the Canadas, and the opening of the West.

Note: Not open to students with credit in Historical Studies 203 or 339.

Historical Studies 213 **H(3-0)**

Canada Since 1867

Themes in the development of the Canadian nation from Confederation to the present, with particular attention to federal-provincial relations, economic development, social movements, and western political protest.

Note: Not open to students with credit in Historical Studies 203 or 341.

Senior Courses

Historical Studies 301 **H(3-0)**

The World to 1500

An historical survey of the development and rise of civilizations, their divergent and interacting patterns of belief, social and political organization and material life.

Historical Studies 303 **H(3-0)**

Great Explorations

The concept of exploration from the time of Columbus to the space voyages, based on the reading of primary sources. Topics include the idea of conquest, views of different races and religions, and myths and realities of explorers and discovered lands.

Historical Studies 305 **H(3-0)**

Economic History

An overview of the history of the world economy, focusing on the diverse experiences of societies striving for material improvement; the economic success of Rome, China, Islamic civilization, and the Industrial Revolution of Western Europe and North America; and basic economic concepts such as economic growth and technological change.

Historical Studies 307 **H(3-0)**

The Contemporary World

The contemporary world from the nineteenth century era of industrialism and empire, through to twentieth century struggles of underdeveloped countries for independence. Stress will be laid on growing global interdependency and the rise and the erosion of western cultural, economic, and political hegemony.

Note: Not open to students with credit in Social Sciences 202.

Historical Studies 309 **H(3-0)**

African History

History of Africa with special reference to economic, social and political developments. Topics include society and the natural environment; migration of peoples, ideas and religions; trading networks; the impact of the slave trade; African reactions to European rule; nationalism and the road to independence.

Historical Studies 311 **H(3-0)**

South Asia and the Indian Ocean from 2500 B.C.E. to the Present

Major events and themes in the history of South Asia and the Indian Ocean littoral. Topics include state formation, the trading world of the Indian Ocean, social and religious developments, the impact of Islamic and European states and economies, modes of reaction to colonial rule, and the course of nationalism.

Historical Studies 315 **H(3-0)**

East Asia to 1800

China, Japan and Korea from antiquity to 1800, highlighting continuities, discontinuities, and salient cultural features.

Topics include the relationships between society, political institutions and thought during certain key periods in the history of China and Japan.

Historical Studies 317 **H(3-0)**

East Asia from 1800

The modern histories of China, Japan and Korea beginning with the Mid-Qing dynasty in China and the Late Tokugawa period in Japan.

Historical Studies 319 **H(3-0)**

Early Medieval Europe, 410-1076

The sack of Rome to the eve of the Investiture Controversy. The economic, social and institutional features of Western Europe, including the origins and rise of the Church, monasticism, barbarian kingdoms, feudalism and the agrarian economy.

Historical Studies 321 **H(3-0)**

High and Late Medieval Europe, 1076-1418

Western Europe from the emergence of national states to the end of the Great Schism. The evolution of the economic, social, religious and cultural structures of Medieval Europe: the revival of agrarian, commercial and urban economies, the development of religious divisions, and the rise of church and state powers.

Historical Studies 323 **H(3-0)**

Renaissance Europe, 1350-1550

Political, economic, social, cultural and intellectual developments which transformed Europe at the end of the Middle Ages.

Historical Studies 325 **H(3-0)**

Reformation Europe, 1460-1559

Roots of religious schism and its impact on politics, diplomacy and society. Special emphasis on religious thought and its repercussions upon society.

Historical Studies 327 **H(3-0)**

Europe in the Era of Religious War, 1559-1715

The clash of Protestant and Catholic forces, the eventual decline in religious passions, and the general crisis of the seventeenth century.

Historical Studies 329 **H(3-0)**

Eighteenth-Century Europe, 1715-1815: Age of Enlightenment and Revolution

State building and international relations; aristocracy, peasants, and the urban middle classes; popular culture; critical spirit of the Enlightenment; crises of the old regimes; the era of the French Revolution and Napoleon.

Historical Studies 331 **H(3-0)**

Nineteenth-Century Europe, 1815-1914: Material Progress and Political Collapse

New ideologies of liberalism, conservatism,

nationalism, and socialism, nineteenth-century revolutions; industrialization and its social consequences; emergence of new nation-states; imperialism, partial emancipation of women; new cultural trends; successes and ultimate failure of the European power balance.

Historical Studies 333 **H(3-0)**

The Age of Totalitarianism

Europe from 1900 to the Cold War. Emphasis will be placed on totalitarian regimes in Italy, Germany, and the Soviet Union; war and society in the two world wars; the Holocaust; and the Cold War.

Historical Studies 335 **H(3-0)**

Cultural History of Russia and Eastern Europe

A survey of Russian and eastern European cultural history from the settlement of the Slavic peoples to the early twentieth century. Topics may include: the ethnic, linguistic, and cultural composition of the region; art and architecture of medieval Russia; the Enlightenment; national revival movements; literature, music and painting; modernism; the cultural efflorescence of the early Soviet period.

Note: Not open to students with credit in Central and East European Studies 313 or Historical Studies 493.19.

Note: Open only to History majors and History Honours students; other students should register for this course as Central and East European Studies 313.

Historical Studies 337 **H(3-0)**

Twentieth Century Canada

Explores major themes in the emergence of moderrn Canada, with emphasis on the rise of a national consciousness, military and diplomatic involvements, the role of the state, socio-economic developments and national unity.

Historical Studies 343 **H(3-0)**

History of Women in Canadian Society

Topics may include the role of women in the economy, politics, social reform, the law, health care, the domestic sphere, life course experiences, and culture.

Historical Studies 345 **H(3-0)**

Canadian Native History

Aboriginal Canada, from the beginnings of contact with Europeans in the sixteenth century, to the present, with particular emphasis on Native-Newcomer relations.

Historical Studies 347 **H(3-0)**

Western Canada

A topical approach to Western Canadian history. Possible topics include: the native people, European exploration, settlement, rural and urban society, social and political reform, the New West, and culture.

Historical Studies 349 **H(3-0)**

Canadian Military History

Survey of the history of the Canadian military in peace and war from 1867 to the present. Emphasis will be placed on Canada's role in World War I and World War II and on the development of the Canadian military in the Cold War era.

Historical Studies 351 **H(3-0)**

A History of Canadian Politics

The historical development of Canadian politics and political culture since Confederation. Major themes will include the emergence and changing role of parties, the impact of federalism, political insurgency and reform, and leadership.

Historical Studies 353 **H(3-0)**

Canadian Social Development

The growth of Canadian society from colonial times to the present. Emphasis on European and American backgrounds of Canadian social institutions and their development in various regional settings. Consideration will be given to the role of immigrants, social and ethnic groups, health, crime and punishment, education, religion, the arts, and recreation.

Historical Studies 357 **H(3-0)**

Wild West/Mild West? Comparative History of the U.S. and Canadian Wests

The similarities and differences in the histories of the Canadian and U.S. Wests from the pre-colonial periods to the present. Topics may include the place of frontier and the West in national historical narratives, myths, and imaginations; aboriginal peoples; immigration and settlement; land policy and land use; and the social relationships and economies that characterize the U.S. and Canadian Wests.

Historical Studies 359 **H(3-0)**

The United States to 1877

A history of the United States from colonial settlement through the era of Reconstruction.

Historical Studies 361 **H(3-0)**

The United States since 1877

A history of the American people since the era of Reconstruction.

Historical Studies 365 **H(3-0)**

Latin America before Independence

The history of colonial Latin America with particular reference to political, social and economic themes such as race relations, imperial rivalries and the struggle for national independence.

Historical Studies 367 **H(3-0)**

Latin America since Independence

A history of the Latin American nations since independence with special attention devoted to political change, economic dependency and modernization, social and economic revolution, and inter-American relations.

Historical Studies 369 **H(3-0)**

Historical Foundations of the Common Law

Historical principles of development underlying the evolution of the Common Law in England and Canada. Topics will include the history of the courts, the judiciary, the law profession, trial by jury, and policing, the historical development of substantive legal concepts and rules, and the uses of legal history. Course work will include a research project based on original legal sources.

Historical Studies 371 **H(3-0)**

Magic, Science, and Religion in Europe to 1600

The relationships among magic, science, and religion as manifested in the concepts of the Devil, Witchcraft, Alchemy, Astrology, the Hermetic Tradition, and the emergence of science from the time of Augustine to the time of Galileo.

Historical Studies 373 **H(3-0)**

Magic, Science, and Religion in Europe after 1600

The relationships among these traditions from 1600 to the present. Topics will include their role in the Scientific Revolution, Science and Religion in the Enlightenment, and the debates about evolution and Christian thought.

Historical Studies 375 **H(3-0)**

Religion in Modern European Society

Topics in religious history from the late eighteenth century to the present, focusing on the relationship between religious belief and modernization; religion and the French Revolution; secularization; religious revival; religious dissent and minorities; the impact of capitalism, socialism, and urbanization; church-state relations; totalitarianism and religion; problems of gauging religious belief.

Historical Studies 377 **H(3-0)**

The Historian's Craft

An introduction to the basic skills for historical research and writing, an inquiry into historical interpretation and analysis and an understanding of various historical or theoretical studies.

Prerequisite: One 200-level Historical Studies course.

Historical Studies 379 **H(3-0)**

War and Society I: From the Medieval Period to the Age of Napoleon

A survey of military history from the Crusades to the Age of Revolution. The emphasis will be on European warfare, and its extension overseas. Topics include: the origins and causes of war; the impact of new inventions on tactics and strategy; military and naval innovation and resistance to innovation, the changing relationship of offense and defence; and the relationship of military institutions to society.

Historical Studies 381 **H(3-0)**

War and Society II: From Waterloo to the Nuclear Age

A survey of military history from 1815 to the modern era. The emphasis will be on the impact of technology on offensive and defensive warfare, and on the nature and limits of naval, military and air power. Topics include: civil military relationships; the concept of mass war; themes such as the development of military medicine, the evolution of methods of supply and transport, and military theory.

Historical Studies 383 **H(3-0)**

War and Society III, The Cold War Era and Beyond

A historical survey of limited and conventional warfare in the nuclear age. The emphasis will be on conflict and tensions since 1945 in such regions as Europe, Asia (Korea and Vietnam), the Middle East, Latin America and Africa. Topics may include military theory, guerrilla warfare, new technology, the logistics of war, and civil-military relations.

Historical Studies 387 (Political Science 387) **H(3-0)**

Political History of Ireland from 1603

A study of modern Ireland from the English conquest of 1603 to the present. It will include a special emphasis on the origins of the contemporary Irish Republic and Northern Ireland.

Historical Studies 389 (Political Science 389) **H(3-0)**

Government and Politics of Japan since 1850

Political development of modern and contemporary Japan, and Japan's diplomatic relations with its Asia-Pacific neighbors.

Note: Not open to students with credit in Political Science 367.

Historical Studies 391 (Political Science 391) **H(3-0)**

Modern Latin American Politics and Society

A political history of modern and contemporary Latin America. Themes may include populism, revolution, militarism, new social movements, and democratization.

Note: Not open to students with credit in Political Science 373.

Historical Studies 401 **H(3-0)**

African History from 1800

Thematic treatment of African societies, their subjugation to colonial rule, with the origins and impact of nationalism and decolonization.

Historical Studies 403 **H(3-0)**

South Asian History from 1750 to 1947

Thematic treatment of South Asian societies from the end of the Mughal period to independence in 1947; the interplay of British and South Asian factors; nationalism and anti-colonialism in India.

Historical Studies 405 **H(3-0)**

Topics in East Asian History

Thematic treatment of East Asian societies. The topic or topics for a given session will be announced in advance and may vary from year to year.

Historical Studies 407 **H(3-0)**

Chinese History

Chinese history through the twentieth century; archaeological and traditional accounts to the middle of the Ming dynasty; modern China from 1500 through the Qing dynasty and the early twentieth century; the history of the Communist movement in China to the death of Mao Zedong in 1976; cultural, intellectual, political, social, diplomatic and military history of China.

407.01. Premodern China to 1500

407.02. Modern China, 1500-1950

407.03. Communist China, 1917-1976

Historical Studies 409 **H(3-0)**

British History

Britain from a feudal to a mercantilist society; Renaissance and Reformation; class and social structure; the rise of London and urban communities; culture and the arts; the Industrial Revolution; the British Empire and Imperialism; the interplay of laissez-faire and socialist ideas; the development of modern British politics, society, and culture.

409.01. Britain 1460-1714

409.02. Britain Since 1714

409.03. Great Britain as a Great Power, 1690-1970

409.04. Medieval Britain to 1460

Historical Studies 411 **H(3-0)**

Russian and Soviet History

A survey of Russian history from the tenth century to the present. Topics include: the role of Orthodox Christianity in Russian society, the rise of Muscovy, the emergence of Imperial Russia, the institution of serfdom, the revolutionary movement, social and economic change, and a comprehensive survey of Soviet history, with special attention to the origins, nature and fate of the Communist Revolution.

411.01. Medieval and Early Imperial Russia

411.02. Late Imperial Russia and the Soviet Union

Historical Studies 413 **H(3-0)**

German History

German history from the Thirty Years' War to the Second World War. Themes include the rise of

Brandenburg-Prussia, Austro-Prussian "dualism," mercantilism, Enlightenment, the impact of the French Revolution and Napoleon, the reform movements, liberalism, and the revolutions of 1848; German unification, the social and economic foundations of the Second Empire, German overseas expansion, the origins and conduct of both world wars, the Weimar republic, Nazism, the Holocaust, and the postwar settlement.

413.01. Germany, 1648-1848

413.02. Germany, 1848-1945

Historical Studies 415 **H(3-0)**

History of Spain and the Spanish Empire

Spain from its ancient Iberian, Greek, Roman, and Islamic roots to the present. Special attention will be given to the Christian Reconquista, the rule of the Catholic Kings, the formation of the Spanish Empire in the New World, and the rise and decline of Spain as European and world power. Themes will include the eighteenth-century Bourbon reforms, the War of Independence, and the nineteenth-century conflicts. In the twentieth century, special attention will be given to the Second Spanish Republic, the Civil War (1936-1939), the dictatorship of Francisco Franco, and contemporary Spain.

415.01. Spain from Iberian Origins through the 1808-1814 War of Independence

415.02. Modern Spain, 1808-Present: Liberalism, Militarism, Regionalism

Historical Studies 417 **H(3-0)**

Italy and the Mediterranean World, 1050-1571

The commercial, cultural and political relationships in the central and eastern Mediterranean littoral, with special reference to selected regions of Latin Europe.

Historical Studies 421 **H(3-0)**

French History

France to the Fifth Republic; France from the end of the Hundred Years' War, emphasizing the institutional and political development of the state and monarchy in the context of social and political upheaval, the development of royal absolutism in theory and practice, and France's role in European affairs; fading Splendour of Versailles; society and institutions of the Ancien Régime; failure of reform; the era of the Revolution and Napoleon; the second cycle of monarchy, republic, and empire; triumph and tragedy in war; the new commitment to modernity.

421.01. France, 1453-1715: Recovery, Crisis, and Royal Absolutism

421.02. France, 1715-1968: Decadence, Revolution, and the Search for Stability

Historical Studies 423 **H(3-0)**

Marriage in Feudal Society: Sacrament, Contract and Alliance

The introduction and evolution of marriage in Western Europe - especially in England, France, and Italy - from the barbarian invasions to the Reformation. The emphasis will be on the influence of the sacramental character of marriage in its various legal, political and social forms.

Historical Studies 425 **H(3-0)**

Marriage and the Family in Early Modern Europe

The changing nature of society and social relations in Early Modern Europe; population and demography, family life, material life and disease, social stratification, religion, and popular and elite cultures.

Historical Studies 427 **H(3-0)**

Ideas that Shaped Modern Europe: The Nineteenth Century

A historical study of romanticism, liberalism, nationalism, socialism, Darwin and Darwinism, the rediscovery of the "irrational," the rise of the social sciences, literary and artistic alienation.

Historical Studies 431 **H(3-0)**

Canada During the World Wars

The nature, course and impact of Canada's involvement in the two world wars. Developments on both the home and battle fronts.

Historical Studies 433 **H(3-0)**

Public History

An introduction to the practice of history in historic sites, museums and other public agencies, and to the skills, methods and techniques employed in these settings. Attention will be given to recent public controversies involving historical interpretation.

Historical Studies 435 **H(3-0)**

Prophets, Priests and Prodigals: Selected Topics in Canadian Religious History

A historical analysis of the pluralistic character of Canadian religions. Themes will include missions, native religions, awakenings, revivalism and social reform, fundamentalism and modernism, secularization and belief.

Historical Studies 437 **H(3-0)**

Canadian Environmental History

Historical development of Canadian attitudes towards nature, from the Amerindians and the first European settlers to the present day.

Historical Studies 439 **H(3-0)**

Topics in Western Canada

A history of Aboriginal societies, the fur trade, Red River settlement, establishment of Canadian institutions, and an agricultural economy, and the resistances of 1869 and 1885; themes in the historical development of the agrarian community in Western Canada; political movements among the western farmers, the nature of plains technology and work, and the economic evolution of the prairies; prairie towns and cities with an emphasis on planning, transportation, population, government, social structure.

439.01. The Early West to 1896

439.02. Rural Society in Western Canada

Historical Studies 441 **H(3-0)**

Images of Western Canada

Views of the Canadian West from varying perspectives in Canadian history: e.g., early British and American travellers, early scientific expeditions, Canadian political groups, entrepreneurs, writers, immigrant literature, social reformers, historians and Western farmers.

Historical Studies 445 **H(3-0)**

The History of Quebec

Quebec from the founding of New France to the present. Although the primary focus will be on Quebec, the history of the French speaking communities outside of the St. Lawrence Valley will also be discussed.

Historical Studies 447 **H(3-0)**

History of the Canadian North

Historical development from the beginnings of European exploration to the present day. Topics include: the native peoples, Arctic exploration, Canadian sovereignty, the politics of northern development.

Historical Studies 449 **H(3-0)**

History of Popular Culture in Canada - 1850 to Present

Selected themes in the historical development of popular ideas, customs, beliefs and attitudes. Topics include: recreation, leisure and sports; class and ethnocultures; the mass media; popular entertainment and music.

Historical Studies 451 **H(3-0)**

Intellectual Roots of Modern Canada

Themes in Canadian intellectual history, including various expressions of nationalism, and the perception of English and French Canadian intellectuals and social reformers of the nature and impact of an urban, industrial and technological society.

Historical Studies 453 **H(3-0)**

Canadian Business History

A survey of Canadian business from the earliest times to the twentieth century. Topics include trading companies, partnerships, banks, insurance companies, industry, managerial capitalism, international enterprise, business-government relations, and businessment and the social order.

Historical Studies 455 **H(3-0)**

Colonial Society in British North America

A comparative study of French and British settlements planted in North America from beginnings to 1867. Topics will include exploration and development, government, institutions, and immigration with particular attention to social and cultural experiences.

Historical Studies 457 **H(3-0)**

The Origins of North American Immigration, 1600 to the Present

The social, economic and political conditions which brought millions of immigrants to the United States. Topics will include emigration, settlement in the United States, and Canadian-American migration movements.

Historical Studies 459 **H(3-0)**

Topics in U.S. Social History

Topics vary from year to year and may include gender, class, race and ethnicity, slavery ,labour, and social movements.

MAY BE REPEATED FOR CREDIT

Historical Studies 461 **H(3-0)**

The Impact of Religious Movements on the United States

The social, political and economic impact of American Catholic, Protestant and Jewish religious institutions and their offshoots.

Historical Studies 463 **H(3-0)**

The United States, 1945 to the Present

The development of a national consensus on the world at home and abroad and the breakdown of that consensus. Topics will include the Cold War, Korea and Vietnam; the social upheavals of the 1960s and 1970s, especially the Black revolution, the Feminist movement, the development of a Youth culture, and the evolution of the imperial presidency to the Watergate Crisis.

Historical Studies 465 **H(3-0)**

Topics in U.S. Regional History

History of the U.S. West or South. Topics will vary from year to year. Regional history of the U.S. West may include issues of gender, settlement, the Mythic West, frontier and region, or historiography. Regional history of the U.S. South may include the rise and fall of slavery, sectional crisis and the Civil War, the New South and the Civil Rights movement.

465.01. The History of Women in the American West

465.02. The American West: Imagination, Myth, and History

465.03. The U.S. South

Historical Studies 467 **H(3-0)**

Mexican History

A social and economic history of Spain's most important colony, New Spain. Focus will be placed upon the introduction of European institutions, the great hacienda, mining, frontier expansion, regionalism, and the wars for independence. Mexico's national experience since independence. Special themes will include nineteenth century political and economic struggles, foreign interventionism, the twentieth century Mexican Revolution, regionalism, relations with the United States, and the rise of the modern republic.

467.01. Mexico: Roots and Traditions to Independence

467.02. Mexico, The Making of the Modern Nation, 1824 to the Present

Historical Studies 469 **H(3-0)**

Latin America: A Study in Diversity Since the Conquest

Selected themes and issues in Latin American History, with an emphasis on social and cultural history.

Historical Studies 471 **H(3-0)**

The Military in Latin America

The history of warfare and the armed forces in Latin America from colonial times to the present. Emphasis upon modern wars, militarism, the rise of caudillos, and the impact of the military on society.

Historical Studies 473 **H(3-0)**

History of Crime and Criminal Justice in England

Crime and the development of the criminal courts and jurisdictions, the police, punishments, and correctional institutions, from medieval to modern times. Attention will be given to the relationship of criminality to moral attitudes and socio-economic conditions, and to the historic role of crime and punishment in local communities, society and the state.

Historical Studies 475 **H(3-0)**

History of Crime and Criminal Justice in Canada

Crime and the development of the criminal law, criminal courts and jurisdictions, the police, punishments, and correctional institutions in eastern, central and western Canada from the late seventeenth to the late twentieth centuries. Attention will be given to the relationship of criminality to moral attitudes and socio-economic conditions, and the historic role of crime and punishment in local communities, society and the state.

Historical Studies 477 **H(3-0)**

History of Science

Historical development of ideas about the natural world from the ancient myths and philosophies of the Middle East and Greece through the time of Galileo. Emphasis on the emergence of Greek science, science in the Middle Ages, and the Copernican Revolution. Historical development of post-Galilean science: the mechanical philosophy, Descartes, Boyle, Newton; 18th-century Newtonianism; the rise of the theory of evolution, Darwin, genetics through the discovery of DNA.

477.01. History of Science, Ancient Times to Galileo

477.02. History of Science, 17th to 20th Centuries

Note: Historical Studies 477.01 is a prerequisite to 477.02.

Historical Studies 479 **H(3-0)**

The Relation of Gender, Race, and Science in a Historical Perspective

A history of scientific explanations of gender and race differences from 1500 to the present.

Historical Studies 483 **H(3-0)**

World War I

An examination of the nature and course of the First World War (1914-1918), with an emphasis on the Western Front. Topics will include the historiography of the war, strategy and tactics, the impact of technology, and the effect of the war on the nations involved.

Historical Studies 485 **H(3-0)**

World War II

The nature, course and short-term results up to 1950 of the Second World War in its global dimensions. The political as well as the military side of the Allied/Axis conflict will be studied.

Historical Studies 487 **H(3-0)**

Brazilian History since 1500

Economic development, political institutions, social and cultural trends, and the interaction between men and women and the environment.

Historical Studies 489 **H(3-0)**

Espionage and the State, 500 BCE - 1939

The rise of modern intelligence services in the West. Changes in the role, importance and technology of intelligence will be assessed. The contribution of intelligence to political and military strategy in selected conflicts will be examined.

Historical Studies 490 **H(3-0)**

Espionage and the State, 1939 to the Present

Intelligence during the Second World War, the Cold War, and afterward. Changes in the role, importance and technology of attention will be assessed. The contribution of intelligence to political systems, international relations and military operations will be assessed.

Prerequisite: Historical Studies 489.

Note: Not open to students with credit in Historical Studies 489.02.

Historical Studies 491 **H(3-0)**

Diplomatic History

A history of international relations and of the foreign policies of states in Europe and the world between the French Revolutionary Wars and the First World War. A history of international relations and of the foreign policies of states in Europe and the world between the end of the First World War and the end of the Cold War.

491.01. Diplomatic History, 1793-1918

491.02. Diplomatic History, 1919-1989

Note: Either Historical Studies 489.01 or 491.01 is a prerequisite for 491.02.

Historical Studies 493 **H(3-0)**

Special Topics in History

The topic or topics for a given session will be announced in advance and will vary from year to year.

MAY BE REPEATED FOR CREDIT

Historical Studies 495 **H(3-0)**

Film and History

Film as a historical document, in particular as a source of social and intellectual history. Topics include: the role of film at moments of decisive historical change; the content and dissemination of political ideologies and social values; film as a source of propaganda; changing attitudes to minority groups; preservation of historical detail.

Historical Studies 497 **H(3-0)**

Markets and Institutions in Historical Perspective

The historical development of the market economy and its supporting institutions, including property rights, and commercial and contract law. Topics will include the transition from feudal agriculture to modern estates, the development of business firms from colonial trading companies to corporations, and controversies surrounding the sanctity of contracts.

Historical Studies 498 **F(3S-0)**

Historical Methods and Philosophies of History

A seminar for Honours students on the interrelationship between the philosophies of History and historical methodology.

Note: Restricted to Honours students and open to other qualified senior students with the permission of the Department.

Historical Studies 499 **H(3-0)**

Latin American Economic History

The internal and external factors that have shaped Latin America's economic growth and development since 1492.

500-Level Courses

Note: Without the permission of the Department of History, all 500-level Historical Studies courses will be restricted to Majors in History, prior to August 15.

Historical Studies 501 **H(3S-0)**

Topics in the History of British Imperialism

A thematic and comparative approach to British Imperialism in Africa and South Asia. Topics can include: race, sex and class and the fashioning of imperial cultures, methods of coercion and resistance in imperial territories, medicine and imperialism, and law and imperialism.

Historical Studies 503 **H(3S-0)**

Topics in East Asian History

Topics may include Japanese and Chinese responses to western culture and expansion, ideas, politics.

Prerequisite: One of East Asian Studies 317, East Asia 300, Historical Studies 209, 301, 315, 317, 405, 407.01, 407.02, 407.03, or consent of the Department.

MAY BE REPEATED FOR CREDIT

Historical Studies 505 **H(3S-0)**

History of Western Monasticism from 600 to 1500

The history of monastic spirituality in Western Europe. The origins, nature, and various forms of monasticism and their evolution from the Benedictine to the Friar in the context of the commercial revolution.

Prerequisite: Historical Studies 319 or 321, or consent of the Department.

Historical Studies 509 **H(3S-0)**

Religion, Politics, and Culture in Early Modern Europe

Topics may include the nature of late medieval religion, the social impact of the Reformations, religious violence and co-existence, and the nature and practice of royal absolutism.

Prerequisite: Historical Studies 323 or 325 or 327, or consent of the Department.

MAY BE REPEATED FOR CREDIT

Historical Studies 511 **H(3S-0)**

The Age of Enlightenment and the Era of Revolution and Napoleon

Enlightenment ideas and institutions, including the challenge to religious orthodoxy, the salons and early feminism, the new "universal" laws of the human sciences, and ideas of progress and the origins and course of the Revolution; the liberal and democratic revolutions; Terror and Virtue; failure of the Republic; the imperial saga in France and Europe.

511.01. The Age of Enlightenment

511.02. Revolution and Napoleon

Historical Studies 513 **H(3S-0)**

Topics in Modern Russian and Soviet History

Topics may include: the establishment and dismantling of the imperial service state; the social, cultural, and economic transformation of late imperial Russia; women and gender; the experience of empire; the origins and fate of the Bolshevik Revolution; Stalinism; the Cold War.

Historical Studies 515 **H(3S-0)**

History of the Holocaust

Nazi persecution and destruction of the European Jews during World War II. Topics will include: the roots of modern anti-Semitism; Nazi policy towards the Jews of Germany in the 1930s; the Nazi's "New Order" in occupied Europe; the technology of murder; Jewish resistance; the attitudes/actions of occupied peoples and Allied governments; the war crimes trials.

Prerequisite: Historical Studies 333 or 413.02 or consent of the Department.

Historical Studies 517 **H(3S-0)**

Social and Political History of Modern Britian

Topics in social, cultural and political history in early modern and modern times: e.g., the rise of the gentry and the middle class, working class identity, radical ideology and two-party politics.

Historical Studies 519 **H(3S-0)**

Canada from Laurier to Pearson

Political, social and economic developments in Canada from 1896-1968, with particular emphasis on domestic history.

Prerequisite: Historical Studies 341 or consent of the Department.

Historical Studies 521 **H(3S-0)**

Canadian Biography

A thematic approach to Canadian personalities, emphasizing the biographer's method and changing interpretations of major Canadian figures, e.g., the prime ministers, prominent women, radicals, prophets, scientists, explorers, entrepreneurs, journalists and artists.

Historical Studies 523 **H(3S-0)**

Topics in Alberta History

Selected topics in Alberta history with emphasis upon the use of local archival sources.

MAY BE REPEATED FOR CREDIT

Historical Studies 525 **H(3S-0)**

Topics in Canadian Intellectual History

Ideas of Canadian political, economic, and cultural theorists and social reformers in the late nineteenth and twentieth centuries.

MAY BE REPEATED FOR CREDIT

Historical Studies 527 **H(3S-0)**

History of Canadian Foreign and Defence Policy and the Canadian Military in World War II and the Cold War Era

Selected topics in Canadian foreign policy, Canadian defence policy or Canadian military history in the period from the outbreak of World War II in 1939 to the 1980s.

Prerequisite: Historical Studies 341 or 349 or consent of the Department.

Historical Studies 529 **H(3S-0)**

Topics in Native History

A history of the Aboriginal peoples of Canada: the First Nations, Inuit and Metis.

MAY BE REPEATED FOR CREDIT

Historical Studies 531 **H(3-0)**

Canadian Historiography

Major schools of historical writing in Canada: imperial, continental and nationalist interpretations; regional historiography of the Maritimes, central Canada and the West; selected historians and their historical methods.

Historical Studies 533 **H(3S-0)**

Gender, Race, Class and Women in Canada

The history of women's diverse experience in Canada will be examined through the study of aboriginal, immigrant, working-class and farm women.

Historical Studies 535 **H(3S-0)**

Topics in American History

Selected topics in the history of the United States from the colonial period to the present.

Prerequisite: Historical Studies 359 or 361 or consent of the Department.

MAY BE REPEATED FOR CREDIT

Historical Studies 537 **H(3S-0)**

Great Awakenings: Revival Religion in U.S. History, 1720-1900

The origins and development of evangelical Christianity and its relationship to the American Revolution, industrialization, the Civil War, and social reform movements.

Historical Studies 541 **H(3-0)**

Topics in the History of Science

Selected aspects of the history of science, e.g., the scientific revolution, science and religion in the seventeenth century, history of scientific methods, studies of individual scientists such as Galileo, Boyle, Newton, or Darwin. For further information in the specific topics to be offered in any year, consult the History Department.

Prerequisite: At least one of the following courses: Historical Studies 371, 373, 477.01 or 477.02.

MAY BE REPEATED FOR CREDIT

Historical Studies 543 **H(3S-0)**

Topics in Great Power Diplomacy and Intelligence

An exploration of selected themes in the history of modern statecraft. Topics may include: theories of international relations, war origins, treaty-making, Fascist diplomacy, appeasement, wartime alliances, intelligence and policy, cold war diplomacy. A seminar in which primary sources will be used.

Prerequisite: One of Historical Studies 423, 485, 489, 491.01, 491.02 or consent of the Department.

Historical Studies 545 **H(3S-0)**

Topics in Military History

An examination of selected problems in modern

military history. Topics may include: military theory; guerrilla warfare from the 18th century to the 20th century; evolution of tactics in World War I; development of military medicine; innovation in European armies; colonial wars.

Prerequisite: One of Historical Studies 349, 379, 381, 383, 431, 471, 481, 483, 485, 489, 491, or consent of the Department.

MAY BE REPEATED FOR CREDIT

Historical Studies 551 H(3-0)
(Political Science 551)

Women in 20th Century Canadian Politics

A political history of women in Canada in the 20th Century. Topics include campaigns for suffrage, legal personhood and equality rights, women's political activism, the evolution of public policy concerning women, and the participation of women in public life.

Prerequisite: Political Science 321, or Historical Studies 343, or consent of the Department.

Historical Studies 553 H(3-0)
(Archaeology 553)

Circum-Caribbean Archaeology and History

The prehistory and history of the indigenous peoples of the Caribbean from the first peopling of the islands to the early contact period.

Prerequisite: Consent of the Department.

Note: Not open to students with credit in Archaeology 531.61.

Historical Studies 565 H(3S-0)

Slavery in Latin America and the Caribbean, 1492-1888

Themes may include the slave trade, plantation and urban slavery, resistance and rebellion, women, culture and religion, abolition, free people of colour in slave societies, and the post-abolition legacy.

Historical Studies 567 H(3-0)
(Political Science 567)

United States Constitutional History

History of constitutionalism in the U.S. from colonial times to the present. The process of constitutional development through judicial interpretation of the basic law.

Historical Studies 569 H(3S-0)

Latin America and the Outside World

The Latin American nations in world affairs with special reference to their intellectual, economic, and political relations with Europe, North America, Africa, and the Pacific Rim. Themes will be drawn from the sixteenth to the twentieth centuries.

Historical Studies 571 H(3S-0)

Religion in History

A thematic approach to religious beliefs, rituals, and behaviour in Europe and North America from the medieval era to the present.

Historical Studies 583 H(3-0)
(Political Science 583)

The United States and the World since 1890

A historical and analytical examination of the development of modern United States foreign policy from the late nineteenth century to the present. Topics include the institutional structure of foreign policy decision-making, including the role of the President, Congress, State Department, Pentagon, and public opinion, and the relationship between domestic politics and foreign policy. Historical dimensions include the turn to imperialism, World War I, the coming of World War II, the Cold War, Korea, Vietnam, Latin American relations, strategic arms limitations talks, and detente.

Prerequisites: Third or fourth year standing and one of Historical Studies 361, Political Science 381 or consent of the Department.

Historical Studies 591 H(3S-0)

Directed Reading and Research

The analysis of historical problems and the use of primary sources. The content of each course will reflect the interests of the instructor.

Prerequisite: Consent of the Department.

Note: May not be used to fulfill the 500-level requirement for a Major in history without the written consent of the Department.

MAY BE REPEATED FOR CREDIT

Historical Studies 593 H(3-0)

Selected Topics in History

Topics will vary from year to year, and will be announced in advance.

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Historical Studies 596 F(3-0)

Honours Directed Reading

Directed readings for Honours students in their third or fourth year.

Historical Studies 598 F(3-0)

Honours Special Subject

The Honours Essay for Honours students in their fourth year.

Graduate Courses

Note: Only a limited number of these 600-level courses will be offered in any one year. Students may obtain further information from the Department.

Historical Studies 601 H(3-0)

Topics in Imperial History

MAY BE REPEATED FOR CREDIT

Historical Studies 603 H(3-0)

Topics in Religious History

MAY BE REPEATED FOR CREDIT

Historical Studies 607 H(3-0)

Topics in Western Canadian History

MAY BE REPEATED FOR CREDIT

Historical Studies 609 H(3-0)
(Strategic Studies 609)

Topics in Canadian Military and Diplomatic History

Historical Studies 633 H(3-0)

Topics in Modern European History

MAY BE REPEATED FOR CREDIT

Historical Studies 637 H(3-0)

Topics in Military History

MAY BE REPEATED FOR CREDIT

Historical Studies 641 H(3-0)

Topics in Medieval or Early Modern European History

MAY BE REPEATED FOR CREDIT

Historical Studies 643 H(3S-0)

Topics on the History of the Israeli Defence Forces

The main issues and dilemmas involved in the building of the Israeli Defence Forces (IDF) against a background of events in the Middle East in the 20th Century.

MAY BE REPEATED FOR CREDIT

Historical Studies 645 H(3-0)

Topics in U.S. History

MAY BE REPEATED FOR CREDIT

Historical Studies 647 H(3-0)

Topics in Latin American History

MAY BE REPEATED FOR CREDIT

Historical Studies 651 H(3-0)

Reading Seminar

Historical Studies 653 H(3-0)

Research and Methods Seminar

Historical Studies 655 H(3-0)
(Strategic Studies 655)
(formerly Historical Studies 481)

Classics of Strategy

Strategic thought from Sun Tzu to Clausewitz, Mahan to Corbett. Analyzes the writings of classic strategic thinkers, and then by way of case studies examines their theories as they pertain to military and political planners from the Peloponnesian War to the present.

Historical Studies 673 H(3-0)

Topics in Legal History

MAY BE REPEATED FOR CREDIT

Historical Studies 690 F(3-0)

Historiography and the Theories of History

Historical Studies 691 H(3-0)

Conference Course in Special Topics

Note: Open only to graduate students.

MAY BE REPEATED FOR CREDIT

Historical Studies 791 H(3S-0)

Conference Course in Special Topics (Advanced Level)

Note: Open only to graduate students.

MAY BE REPEATED FOR CREDIT

Historical Studies 795 **H(3S-0)**

Advanced Seminar in Historiographical Interpretations

Historical Studies 797 **H(3S-0)**

Advanced Seminar in Historical Research

Human Resources and Organizational Dynamics HROD

Instruction offered by members of the Haskayne School of Business.

Human Resources and Organizational Dynamics Chairperson – A. Ponak

Note: Students have the opportunity to take courses offered by the Haskayne School of Business without the stated prerequisites, with the written permission of the Associate Dean (Undergraduate Programs) as appropriate, upon the recommendation of the Instructor of the course. However, should a student fail to achieve satisfactory standing in any course for which the stated prerequisite(s) is (are) lacking, he/she may be required to successfully complete the stated prerequisite(s) prior to being permitted to repeat the course. Students are required to have consent of the Haskayne School of Business Office before registering in 600-level courses offered by the Haskayne School of Business.

Senior Courses

Human Resources and Organizational Dynamics 317 **H(3-1)**

Employment Relationships in Canada

Introduction to the factors that shape and influence employment relationships in Canada, with a focus on how these factors influence psychological contracts, organization and structure of work, legal requirements, work site governance, motivation, managing performance and staffing practices. Evaluation may include a number of skill development assignments, examinations, and a major paper.

Prerequisites: Admission to the Haskayne School of Business and second year standing.

Note: Credit for both Human Resources and Organizational Dynamics 317 and either Human Relations and Organizational Dynamics 323 or Management of Organizations and Human Resources 323 will not be allowed.

Human Resources and Organizational Dynamics 321 **H(3-0)**
(formerly Management of Organizations & Human Resources 321)

Foundations in the Human Resources and Organizational Dynamics

Energies, skills and abilities of people to meet the challenge of today's organizations; diagnostic skills to recognize and analyze organizational problems; the linkage between effective management of people and goal accomplishment for organizations; current challenges in organizational forms, diverse environments and cultures; foundation for further study of Human Resources and Organizational Dynamics concepts.

Prerequisite: Second year standing.

Note: This course is not available for credit towards the Bachelor of Commerce degree. Until August 15, preference in enrollment is given to students who have declared a Management and Society minor.

Human Resources and Organizational Dynamics 401 **H(3-0)**

Competitive Advantage Through People

Analysis of the interdependencies and theoretical foundations of staffing and development programs, design and administration of reward and compensation systems and performance management programs from the orientation of professional human resources management.

Prerequisites: Third year standing and Human Resources and Organizational Dynamics 317.

Note: Credit for any of Human Resources and Organizational Dynamics 441, 443, 447 or 559.03 and 401 will not be allowed.

Human Resources and Organizational Dynamics 403 **H(3-0)**

Organizational Analysis and Change

Analysis of process of designing and structuring organizations and experience in the planning of design strategies as a response to change and innovation in the internal and external environment of the organizations.

Prerequisites: Third year standing and Human Resources and Organizational Dynamics 317.

Note: Credit for both Human Resources and Organizational Dynamics 403 and either 423 or 431 will not be allowed.

Human Resources and Organizational Dynamics 405 **H(3-0)**

Labour Relations

Examination of the nature and role of labour relations in the resolution of issues affecting employers, employees and the public interest.

Prerequisites: Third year standing and Human Resources and Organizational Dynamics 317.

Note: Credit for both Human Resources and Organizational Dynamics 405 and 445 will not be allowed.

Human Resources and Organizational Dynamics 421 **H(3-0)**
(formerly Management of Organizations & Human Resources 421)

Interpersonal Behaviour

Focus on increasing self-awareness, self-understanding and presentation of self. Interpersonal skills development necessary for group effectiveness and team management provide basis for performance leadership. Format involves learning in small groups.

Prerequisites: Third year standing and Human Resources and Organizational Dynamics 317.

Human Resources and Organizational Dynamics 449 **H(3-1T)**
(formerly Management of Organizations & Human Resources 449)

Arbitration of Employment Disputes

Workplace dispute resolution using arbitration and mediation. Topics include discipline, drug testing, surveillance, dress codes, discrimination, absenteeism, employment contracts. Emphasis on legal principles in employment and advocacy skills using simulations, case law and guest speakers.

Prerequisites: Third year standing and Human Resources and Organizational Dynamics 317.

Human Resources and Organizational Dynamics 491 **H(3-0)**
(formerly Management of Organizations & Human Resources 491)

Lifework Planning & Career Assessment

Persons demonstrate competency in personal and career development by their ability to take personal responsibility for the quality of their lives. Assess skills and values and plan for personal and career development after graduation.

Prerequisites: Third year standing and Human Resources and Organizational Dynamics 317.

Human Resources and Organizational Dynamics 493 **H(3-0)**
(formerly Management of Organizations & Human Resources 493)

Business Negotiations

The major concepts and theories of bargaining and negotiation; the dynamics of interpersonal and intergroup conflict; analysis of bargaining and conflict relationships and exploration of individual bargaining styles. Application to a variety of negotiation situations. Use of simulations and written assignments.

Prerequisites: Third year standing and Human Resources and Organizational Dynamics 317.

Human Resources and Organizational Dynamics 559 **H(3-0)**
(formerly Management of Organizations & Human Resources 559)

Selected Topics in Management and Organizations

Examination of selected topics in management and organizations.

Prerequisites: Third year standing and Human Resources and Organizational Dynamics 317.

MAY BE REPEATED FOR CREDIT

Graduate Courses

Human Resources and Organizational Dynamics 601 **H(3-0)**

Managing Human Resources

Survey course on managing the human side of business. Development of leadership and team skills.

Note: Credit for both Human Resources and Organizational Dynamics 601 and either 621 or Management Studies 601 will not be allowed.

Human Resources and Organizational Dynamics 631 **H(3-0)**

Managing Human Resources from a Strategic Perspective

Integrated coverage of human resource management theory, practice and research as it applies to the strategic management of organizations.

Prerequisite: Human Resources and Organizational Dynamics 601, 621 or Management Studies 601.

Note: Credit for both Human Resources and Organizational Dynamics 631 and Management Studies 603 will not be allowed.

Human Resources and Organizational Dynamics 691 **H(3-0)**
(formerly Management of Organizations & Human Resources 691)

Project Team Building and Interpersonal Skills

Leadership style and behaviour; interpersonal effectiveness and self-awareness; project teams; group dynamics; organizational change; application to the project environment.

Note: Available only to students in the MEng Program (Project Management). Not open to students in the MBA Program.

Human Resources and Organizational Dynamics 721 H(3-1)
(formerly Management of Organizations & Human Resources 721)

Advanced Leadership and Technical Skills

Covers increasing self-awareness, self-understanding and presentation of self. The interpersonal skills necessary for group effectiveness, team management and performance leadership will be analyzed and developed through small group exercises.

Prerequisite: Human Resources and Organizational Dynamics 601, 621 or Management Studies 601.

Human Resources and Organizational Dynamics 723 H(3-1)
(formerly Management of Organizations & Human Resources 723)

Organizational Change and Development

Diagnosing organizational situations where the need for change exists and facilitating such changes. Utilization of behavioural science knowledge for organizational problem-solving.

Prerequisite: Human Resources and Organizational Dynamics 601, 621 or Management Studies 601.

Human Resources and Organizational Dynamics 725 H(3-0)
(formerly Management of Organizations & Human Resources 725)

Organizational Analysis and Design

Application of knowledge of organizational theory and behaviour to organizational analysis and design. Emphasis will be placed on the acquisition of the required analysis and design skills based on an understanding of how organizations are structured, how they function and their relationships with their environment.

Prerequisite: Human Resources and Organizational Dynamics 601, 621 or Management Studies 601.

Human Resources and Organizational Dynamics 727 H(3-0)

Competitive Advantage Through People

Analysis of the interdependencies and theoretical foundations of staffing and development programs, design and administration of reward compensation systems and performance management programs from the orientation of professional human resources management.

Prerequisite: Human Resources and Organizational Dynamics 601, 621 or Management Studies 601.

Human Resources and Organizational Dynamics 729 H(3-0)
(formerly Management of Organizations & Human Resources 729)

Workplace Issues

Examination of the employment relationship, with a focus on controversial and significant topics in the workplace. Coverage may include: unjust dismissal; drug and alcohol testing; computer and internet policies; privacy and surveillance; impact of unions; disability and accommodation; and workplace violence. Modular format with modules customized to meet student interests.

Prerequisite: Human Resources and Organizational Dynamics 601, 621 or Management Studies 601.

Human Resources and Organizational Dynamics 731 H(3-0)
(formerly Management of Organizations & Human Resources 731)

Lifework Planning and Career Assessment

Persons demonstrate competency in personal and career development by their ability to take personal responsibility for the quality of their lives. Students will clarify their competencies and values and plan for dealing with the challenges faced by mature adults.

Prerequisite: Human Resources and Organizational Dynamics 601, 621 or Management Studies 601.

Human Resources and Organizational Dynamics 789 H(3S-0)
(formerly Management of Organizations & Human Resources 789)

Seminar in the Management of Human Resources

Intensive study and discussion of current literature, research and issues with respect to selected topics in the management of human resources.

Prerequisite: Human Resources and Organizational Dynamics 601 or consent of the business school.

MAY BE REPEATED FOR CREDIT

Human Resources and Organizational Dynamics 793 H(3-0)

Business Negotiations

The major concepts and theories of negotiation; the dynamics of interpersonal and intergroup conflict; analysis of negotiation strategies and individuals styles. Application to a broad range of business negotiations. Use of simulations and written assignments.

Prerequisite: Human Resources and Organizational Dynamics 601, 621 or Management Studies 601.

Note: Credit for both Human Resources and Organizational Dynamics 793 and 789.03 will not be allowed.

Human Resources and Organizational Dynamics 797 H(3S-0)
(formerly Management of Organizations & Human Resources 797)

Advanced Seminar in Human Resources and Organizational Dynamics

Prerequisite: Consent of the business school.

MAY BE REPEATED FOR CREDIT

PhD Course

Human Resources and Organizational Dynamics 799
H(3S-0)
(formerly Management of Organizations & Human Resources 799)

Doctoral Seminars in Human Resources and Organizational Dynamics

799.01. Organizational Behaviour

799.02. Organization Theory

799.03. Industrial Relations

799.04. Human Resource Management

799.05. Interorganizational Relationships: Creating and Managing Strategic Alliances

799.06. Managing Mergers and Acquisitions

Humanities HUMN

Instruction offered by members of the Faculty of Humanities.

Junior Course

Humanities 200 F(1-2)

Humanist Perspectives on Human Issues

Introduction to central issues and research methods in the Humanities, using primary source material from literature, religion, philosophy, and the arts. Texts will be studied from a variety of disciplinary and interdisciplinary perspectives. Tutorials will offer opportunities for discussion and instruction in academic writing and basic research methods.

Senior Courses

Humanities 300 F(3-0)
(Bachelor of Accounting Science 300)

Humanistic Issues in Commercial Practice

Covers the cultural, social, political and ethical influences on commercial practices and value-exchange from classical times to the present. Its aim is to develop historical perspective and critical thinking.

Note: Students must be registered in the Bachelor of Accounting Science degree program to register in this course.

Humanities 305 H(3-0)

The Human Situation I

Examines various views concerning human nature, the human situation, and human responsibilities. Requires intensive reading of a moderate number of works of a literary, philosophical, or religious character that express such views.

Humanities 307 H(3-0)

The Human Situation II

A continuation of Humanities 305.

Prerequisite: Humanities 305.

Humanities 405 H(3-0)

Topics in Medieval, Renaissance and Reformation Studies

Seminar designed to consolidate subject matter covered in a variety of disciplines and introduce research methodologies in Medieval, Renaissance and Reformation Studies. Topics such as bibliography, history of the disciplines and their methodologies, typology of sources, orality and literacy, and Latin and vernacular palaeography will be covered.

Prerequisite: Consent of the Program Coordinator.

Indigenous Studies INDG

Instruction offered by members of the Faculties of Social Sciences, Communication and Culture, Fine Arts, Humanities, and Social Work as part of the Minor in Indigenous Studies.

Co-ordinator – C.J. Voyageur

Senior Course

Indigenous Studies 407 **H(3-0)**

Comparative International Indigenous Communities

Social, economic, and political comparisons between selected Indigenous communities throughout the world. Required capstone course for the Minor in Indigenous Studies.

Prerequisites or Corequisites: Any three of Anthropology 337, Canadian Studies 311, Historical Studies 345, Sociology 307, or after August 15, with consent of the co-ordinator.

Informatics INFO

Instruction and services offered under the direction of the Library. For further information contact the Informatics Librarian, Business Library, Scurfield Hall, telephone 220-4410.

Graduate Course

Informatics 601 **Q(0-1)**

Research Services

A non-credit, fee-based research course designed for distance education students from other institutions and organizations, Informatics 601 provides distant learning students with specialized library service and access to resources tailored to meet individual and program needs and offers convenient and customized one-on-one personal consultation with a liaison librarian. The course has been implemented to equip students with current research skills for lifelong learning. Students enrolled in this course with receive on-site instruction in bibliographic research, personalized one-on-one consultation with liaison librarians, and access to reference service via voice-mail, e-mail, and fax. They will also enjoy full borrowing privileges, on-site access to CD-ROM databases (including the ability to book workstations to guarantee designated search times), remote access to selected databases, Internet services and sources, Internet research tools, and document delivery services with direct delivery of articles to home, office or e-mailbox. All students will be expected to arrange Internet access through a provider in their community. Charges for document delivery vary depending on the method of delivery requested.

Prerequisite: Consent of the Informatics Librarian.

Innovation INNO

Instruction offered by members of the Faculties of Communication and Culture, Engineering, Humanities, Science, Social Sciences and the Haskayne School of Business. For information, contact the Dean's Office, Faculty of Communication and Culture, (403) 220-5885.

Senior Courses

Innovation 321 **H(3-2T)**

Principles of Innovation

Innovation is a process through which knowledge and new ideas are applied to create new economic and social benefits. Students are introduced to definitions, contexts, language, dynamics, historical and contemporary examples, issues, aspects, outcomes, pitfalls, and impacts of the innovation process from a multidisciplinary perspective. Literature on innovation is explored. Seeks to develop in students the intuitive and imaginative skills necessary for inventive processes, and to investigate the impact of the innovation process. Blend of face-to-face and web-based instruction.

Note: Open to students from all programs.

Innovation 323 **H(3-2T)**

The Practice of Innovation

Provides experience in the innovation process, to aid students to understand the nature of this creative process in different contexts, and to nurture innovative thinking. Hands-on project in multidisciplinary teams of students and professors. Student projects will take the form of case studies of and/or involvement in actual innovation processes in different contexts. Seeks to teach through experience and peer-based interaction the processes of invention. Session will end with an "innovation fair" of teams' presentations. Blend of face-to-face and web-based instruction.

Instruction offered by the Faculty of Social Sciences.

Coordinator – J.F. Keeley

Senior Courses

International Relations 501 **H(3-0)**

Advanced Seminar in International Relations

An integrative seminar on selected themes from the International Relations field.

Prerequisites: Fourth year standing and admission to the Major or consent of the Program Coordinator.

International Relations 597 **H(3-0)**

Independent Study

Prerequisite: Consent of the Program Coordinator.

Note: Normally open only to third and fourth year majors in International Relations. Students wishing to register in this course must submit to the Program Coordinator a detailed statement by the instructor of the work to be carried out.

Internship INTE

Senior Courses

Internship 503 **H(4 months)**

Internship in Computer Science

503.01. Internship in Computer Science I

503.02. Internship in Computer Science II

503.03. Internship in Computer Science III

503.04. Internship in Computer Science IV

NOT INCLUDED IN GPA

Internship 513 **H(4 months)**

Internship in Engineering

513.01. Internship in Engineering I

513.02. Internship in Engineering II

513.03. Internship in Engineering III

513.04. Internship in Engineering IV

NOT INCLUDED IN GPA

Internship 523 **H(4 months)**

Internship in Health Sciences - Biomedical Sciences

523.01. Internship in Biomedical Sciences I

523.02. Internship in Biomedical Sciences II

523.03. Internship in Biomedical Sciences III

523.04. Internship in Biomedical Sciences IV

NOT INCLUDED IN GPA

Internship 533 **H(4 months)**

Internship in Bioinformatics

533.01. Internship in Bioinformatics I

533.02. Internship in Bioinformatics II

533.03. Internship in Bioinformatics III

533.04. Internship in Bioinformatics IV

NOT INCLUDED IN GPA

Italian ITAL

Instruction offered by members of the Department of French, Italian and Spanish in the Faculty of Humanities.

Department Head – A.J. Wall

French, Italian and Spanish speaking students or students with more than matriculation in these languages (including graduates of a bilingual or immersion program) MUST consult the Department to be placed in a course corresponding to their ability. Native speakers are not eligible to take language courses by special assessment or to receive advanced credit for them.

Note on Prerequisites: All university level prerequisites for Italian language courses must be met with a grade of "C-" or better.

Junior Courses

Italian 201 **H(4-1)**

Beginners' Italian I

This course, designed for students with no previous knowledge of the language, provides training in the comprehension, speaking, reading and writing of Italian.

Note: Not open to students with credit in Italian 30 or equivalent.

Italian 203 **H(4-1)**

Beginners' Italian II

A continuation of Italian 201.

Prerequisite: Italian 30, Italian 201 or equivalent.

Senior Courses

Italian 301 **H(3-1T)**

Second-Year Italian

An intensive course in reading, writing and oral practice.

Prerequisite: Italian 203 or consent of the Department.

Italian 305 **H(3-1)**

Introduction to Textual Analysis

Development of critical thinking and communicative skills through the analysis of selected literary and non literary texts.

Prerequisite: Italian 301 or consent of the Department.

Italian 307 **H(3-1)**

Communication

Study of different types of communication (print and electronic media, correspondence, business). Analysis of relevant aspects of Italian contemporary life.

Prerequisite: Italian 301 or consent of the Department.

Italian 309 **H(3-1)**

Arts and Popular Culture

Aspects of Italian civilization and contemporary cultural issues in Italian Studies.

Prerequisite: Italian 203 or consent of the Department.

Italian 401 **H(3-1T)**

Third-Year Italian

A course in composition and conversation for advanced students in Italian. Selected readings from literary texts.

Prerequisites: Italian 301 and one other half course at the 300 level (including Romance Studies 341), or consent of the Department.

Italian 405 **H(3-0)**

Selected Works in Italian Literature

Introduction to Italian literature with particular emphasis on the novel and poetry.

Prerequisites: Italian 301 and one other half course at the 300 level (including Romance Studies 341), or consent of the Department.

MAY BE REPEATED FOR CREDIT

Italian 407 **H(3-0)**

Performance as Cultural Expression

Study of Italian theatre, opera and drama as well as popular forms of cultural expression such as festival, music and figurative art.

Prerequisites: Italian 301 and one other half course at the 300 level (including Romance Studies 341), or consent of the Department.

Italian 409 **H(3-1)**

Italian Culture through Cinema

Significant social, cultural and historical issues in Italian society through the medium of film.

Prerequisites: Italian 301 and one other half course at the 300 level (including Romance Studies 341), or consent of the Department.

Italian 499 **H(3-0)**

Selected Topics in Italian Studies

Selected topics in Italian language, literature or civilization.

Prerequisites: Completion of three half courses at the 300 level in Italian or consent of the Department.

MAY BE REPEATED FOR CREDIT

Italian 501 **H(3-0)**

Interdisciplinary Study of Italian Culture

Capstone project in Italian studies. Discussion of selected topics related to students' field of concentration.

Prerequisites: Italian 401 and at least one half course from cluster IV courses, or consent of the Department.

Japanese JPNS

Instruction offered by members of the Department of Germanic, Slavic and East Asian Studies in the Faculty of Humanities.

Department Head – X-J. Yang

Note: Japanese 317 is given in English and no knowledge of Japanese is required.

Junior Courses

Japanese 205 **H(4-1)**

Beginners' Japanese I

Basic concepts of modern Japanese. Reading and writing of characters, essentials of grammar, basic vocabulary, and oral drills on normal speech patterns.

Japanese 207 **H(4-1)**

Beginners' Japanese II

Continuation of Japanese 205.

Prerequisite: Japanese 205 or consent of the Department.

Senior Courses

Japanese 301 **H(3-1)**

Continuing Japanese I

Further acquisition of Japanese characters, and the development of conversational skills through reading and discussion of selected Japanese texts. Structural analysis of normal speech patterns. Preparation of written assignments. A continuation of Japanese 207.

Prerequisite: Japanese 207 or consent of the Department.

Japanese 303 **H(3-1)**

Continuing Japanese II

Continuation of Japanese 301.

Prerequisite: Japanese 301 or consent of the Department.

Japanese 317 **H(3-0)**

Japanese Civilization

Discussion of the principal trends in the development of the Japanese civilization and its place in the Asian setting.

Note: This course is taught in English; no knowledge of Japanese is required.

Japanese 331 **H(3-0)**

Intermediate Japanese I

An intermediate course giving emphasis to both writing and oral skills. Some of the more difficult aspects of modern Japanese grammar will be studied.

Prerequisite: Japanese 303 or consent of the Department.

Japanese 333 **H(3-0)**

Intermediate Japanese II

A continuation of Japanese 331.

Prerequisite: Japanese 331 or consent of the Department.

Japanese 341 **H(3-0)**

Introduction to Japanese Literature

Reading and discussion of selected works of modern Japanese literature.

Prerequisite: Japanese 303 or consent of the Department.

Japanese 461 **H(3-0)**
(Chinese 461)

Japanese-Chinese Cultural Relations

Discussion of cultural relations and influences between Japan and China. Topics may include cultural identities and cross-influences, literary and artistic traditions, writing systems, and will be listed in the Master Timetable.

Prerequisite: Either Japanese 303 or Chinese 303, or consent of the Department. Knowledge of the other language would be beneficial.