

840. French Quebecois Literature
Spring of even-numbered years. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course.
R: Approval of department.
Major authors and selected topics in the poetry, prose, and drama of Quebec.
QA: FRN 871

845. Francophone Third World Literature
Fall of odd-numbered years. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course.
Leading figures, themes, and movements of Francophone literatures outside France. The colonial period, Negritude, satire, commitment and revolution, and problems of independence.
QA: FRN 871

890. Independent Study
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 9 credits in all enrollments for this course.
R: Approval of department.
Special projects, directed reading, and research arranged by an individual graduate student and a faculty member in areas supplementing regular course offerings.
QA: FRN 860

891. Special Topics in French
Fall, Spring, Summer. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course.
R: Approval of department.
Special topics supplementing regular course offerings proposed by faculty for graduate students on a group study basis.

999. Doctoral Dissertation Research
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 24 credits in all enrollments for this course.
R: Approval of department.

QA: FRN 999

GENERAL BUSINESS AND BUSINESS LAW GBL

Department of General Business and Business Law
The Eli Broad College of Business and The Eli Broad Graduate School of Management

395. Law, Public Policy, and Business
Fall, Spring, Summer. 3(3-0)
R: Open only to juniors and seniors in the College of Business or in programs that list GBL 395 as a catalog requirement. Not open to students with credit in GBL 395H.
Structure of the legal system. Basic concepts of constitutional law, torts, contracts, and product liability. Administrative law and government regulation of business.
QA: GBL 431, GBL 341, GBL 450

395H. Law, Public Policy, and Business-1. Honors
Fall. 3(3-0)
R: Open only to Honors College juniors and seniors, or approval of department. Not open to students with credit in GBL 395.
Structure of the legal system and basic concepts of constitutional law, torts, contracts, and product liability. Administrative law and government regulation of business.
QA: GBL 431, GBL 341, GBL 450

420. Role of Law and Lawyers in Society
Fall, Spring. 3(3-0)
P: GBL 395. R: Open only to seniors and graduate students in the College of Business.
Law and its relationship to economics, business, and social justice. Comparative law. Legislative and judicial processes. The role of lawyers. Overview of legal education.
QP: GBL 430

447. Hospitality Law
Fall, Spring. 3(3-0)
P: GBL 395. R: Open only to seniors and graduate students in Hotel, Restaurant and Institutional Management.
Legal aspects of hospitality industry, including contracts and sales, torts, commercial paper, and organization. Dynamics of the changing work force and employment discrimination. Franchising.
QP: GBL 430 QA: GBL 447

451. Law of Commercial Transactions
Spring. 3(3-0)
P: GBL 395. R: Open only to seniors and graduate students in the College of Business.
Law of contracts and sales, commercial paper, secured transactions, consumer credit, and debtor-creditor relationships.
QP: GBL 450 QA: GBL 451

460. International Law and Business
Spring. 3(3-0)
P: GBL 395. R: Open only to seniors and graduate students in the College of Business.
The impact of international law on business practices. Government regulation of international business.
QP: GBL 430 QA: GBL 460

480. Corporate and Professional Social Responsibility
Spring. 3(3-0)
P: GBL 395. R: Open only to seniors and graduate students in the College of Business.
Institutionalization of American working life, large business institutions, and the law. Control of large business institutions. Social obligations of corporations and professions. Impact of institutional values on individual values.
QP: GBL 430

490. Independent Study
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course.
P: GBL 395. R: Open only to seniors. Approval of department.
Program of observation and work in selected business firms and government. Supervised independent research on selected legal topics.
QP: GBL 430 QA: GBL 468

848. Legal Environment of Business
Fall, Spring. 3(3-0)
R: Open only to students in the Professional Accounting, Master of Business Administration programs, and to students in programs for which GBL 848 is a catalog-listed requirement.
The legal, political, and social environment of business and the structural framework in which law functions.
QA: GBL 848

859. Business Legal Environment
Spring. 2(2-0)
R: Open only to Master's students in the Advanced Management Program.
Critical analysis of government regulation of business from legal, political, and social perspectives. An examination of moral concepts and social policy underlying government regulation.
QA: GBL 890

880. Corporate and Professional Social Responsibility
Fall. 3(3-0)
R: Open only to graduate students in Business and students in programs for which GBL 880 is a catalog-listed requirement.
Impact of corporations and professions in societies and across societies. Control of business organizations. Social and moral responsibilities of organizations. The individual's role in a business organization.

890. Independent Study
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course.
P: GBL 848. R: Open only to graduate students in Business. Approval of department.
Faculty-supervised independent study.
QP: GBL 848 QA: GBL 890

GENETICS GEN

College of Natural Science

800. Genetics Seminar
Fall, Spring, Summer. 1(1-0) A student may earn a maximum of 12 credits in all enrollments for this course.
Critical analysis of current literature. Student presentations.
QA: GEN 800

880. Laboratory Rotation
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course.
R: Open only to Ph.D. majors in Genetics.
Participation in research with faculty members.
QA: GEN 880

890. Selected Topics in Genetics
Fall, Spring, Summer. 2 to 5 credits. A student may earn a maximum of 9 credits in all enrollments for this course.
P: ZOL 341.
Topic selected from molecular genetics, physiological genetics, population genetics, quantitative genetics, microbial genetics, somatic cell genetics, behavioral genetics, human genetics, evolution, or radiology and mutagenesis.
QP: ZOL 341 QA: GEN 890

999. Doctoral Dissertation Research
Fall, Spring, Summer. 1 to 12 credits. A student may earn a maximum of 99 credits in all enrollments for this course.
R: Open only to Ph.D. students in Genetics.
QA: GEN 999

GEOGRAPHY GEO

Department of Geography College of Social Science

113. Introduction to Economic Geography
Fall, Spring. 3(3-0)
Spatial distribution of resources, population, enterprise, trade, consumption, and production. Interaction of those distributions at local to global scales.
QA: GEO 213

151. Cultural Geography
Fall, Spring of odd-numbered years. 3(3-0)
Systematic approach to the spatial distribution of cultural features, processes, and relationships.
QA: GEO 201

203. Introduction to Meteorology
Fall. 3(3-0)
Fundamentals of meteorology. Energy balance, adiabatic processes, horizontal motion, cyclogenesis, and severe weather.
QA: GEO 351

206. Physical Geography
Fall, Spring. 3(3-0)
Geographic and functional interrelationships within the physical environment: Earth-sun relationships, weather, climate, soils, vegetation and landforms (terrain characteristics).
QA: GEO 206

206L. Physical Geography Laboratory
Fall, Spring. 1(0-2)
P: GEO 206 or concurrently.
Geographic aspects of weather, climate, soil, vegetation, and terrain. Interpretation and application of maps and remotely sensed imagery.
QA: GEO 206L

223. Introduction to Cartography
Fall. 4(2-14)
Cartographic principles and techniques of making maps. Cartographic decision-making and methods for both conventional and computer mapping.
QA: GEO 223

**Descriptions—Geography
of
Courses**

224. Introduction to Remote Sensing

Fall, Spring. 4(2-4)
R: Not open to freshmen.
Conventional airphoto characteristics and interpretation techniques. Basic features of radar, thermal, and multispectral imagery. Applications in professional fields such as agriculture, archaeology, forestry, geography, planning, wildlife.
QA: GEO 224

225. Introduction to Geographic Information Systems

Fall. 4(3-2)
Components, data structures, basic operations, and applications of geographic information systems. Laboratory exercises with software systems.

230. Geography of the United States and Canada

Fall, Spring, Summer. 3(3-0)
Regional analysis. Evolution and status of environmental, demographic, economic, and sociocultural patterns and processes.
QA: GEO 300

233. Geography of Michigan

Fall of odd-numbered years. 3(3-0)
Physical and cultural geography of Michigan.
QA: GEO 407

259. Geography of Recreation and Tourism

Fall of even-numbered years. 3(3-0)
Cultural, physical, and biotic factors affecting the distribution of recreation and tourism resources and participation. U.S. and international examples and case studies.
QA: GEO 309

335. Geography of Latin America

Fall. 3(3-0)
R: Not open to freshmen.
Physical and human geography of Latin America. Current development issues, especially people-environment interaction in urban and rural areas. Topics include migration, urbanization, and industrialization.
QA: GEO 315, GEO 316

336. Geography of Europe

Fall of odd-numbered years. 3(3-0)
R: Not open to freshmen.
Major regions and nations, including their physical resources, peoples, political structures, and economies.
QA: GEO 340, GEO 342

337. Geography of East Asia

Spring. 3(3-0)
R: Not open to freshmen.
Spatial patterns and processes of physical and human geography in China, Japan, Korea, and Taiwan. Emphasis on development problems, especially since 1950.
QA: GEO 364, GEO 365

338. Geography of Africa

Fall. 3(3-0)
R: Not open to freshmen.
Physical and human geography of Africa. Current development issues, especially people-environment interaction in urban and rural areas. Topics include drought, agricultural patterns, hunger, rural development, migration, and urbanization.
QA: GEO 321, GEO 322

401. Geography of Plants of North America

Spring of odd-numbered years. 3(3-0)
R: Not open to freshmen and sophomores.
Geography of Plants in North America with emphasis on the East. Related ecological principles, soils, and post-Cretaceous geologic history. Some field instruction.
QA: GEO 432

402. Agricultural Climatology

Fall of even-numbered years. 3(3-0) Interdepartmental with Agricultural Engineering.
P: MTH 116. R: Not open to freshmen and sophomores.
Relationships between climate and agriculture in resource assessment, water budget analysis, meteorological hazards, pests, crop-yield modeling, and impacts of global climate change.
QP: MTH 109 or MTH 111

404. Synoptic Climatology

Fall. 4(4-0)
P: GEO 203.
Global climate patterns and their controls. Relationship between upper air flow and weather in the northern hemisphere westerlies.
QP: GEO 206, GEO 351 QA: GEO 451

405. Applied Synoptic Climatology: Principles and Methods

Spring of even-numbered years. 4(3-12)
P: GEO 404 or approval of department; MTH 116.
Dynamic and thermodynamic principles of atmospheric science applied to the development and evolution of extratropical cyclones. Laboratory sessions include analysis of current observations and satellite imagery.
QP: GEO 351, MTH 109 or MTH 111 QA: GEO 452

406. Environmental Geomorphology

Fall of even-numbered years, Spring.
3(3-0) Interdepartmental with Geological Sciences.
P: GEO 106 or ISP 203 or GLG 201 or GLG 301. R: Not open to freshmen and sophomores.
Relationships of running water, weathering, gravity, ice, waves, wind, and biota to terrain and soils. Evolution of landscapes. Classical and modern interpretations. Field study optional.
QP: GEO 206 or GLG 201 or GLG 200 QA: GEO 431

407. Regional Geomorphology of the United States

Fall of odd-numbered years. 3(3-0)
P: GEO 106 or GLG 201 or GLG 301 or ISP 203.
Geomorphic characteristics of physiographic regions of the United States.
QP: GEO 206, GLG 201 QA: GEO 429

408. Soil Geomorphology Field Study

Fall. 4(2-4)
P: GEO 106 or GLG 201 or CSS 210. R: Not open to freshmen and sophomores.
Common geographic relationships among soils, landforms, and vegetation in lower Michigan. Description, analysis, and genesis of soils and landscapes. Surficial processes. Required field trips, incurring some student expenses.
QP: GEO 206 or GLG 200 or CSS 210 QA: GEO 420

413. Urban Geography

Fall. 3(3-0)
P: GEO 113. R: Not open to freshmen and sophomores.
Theories and models of urban spatial form. Underlying structures and processes. Socio-spatial dimensions of modern urbanism. Differentiation and locational conflict in residential, commercial, and industrial space.
QP: GEO 213 QA: GEO 403

414. Geography of Transportation

Fall of odd-numbered years. 3(3-0)
P: GEO 113. R: Not open to freshmen.
Spatial principles of transportation. Theories of interaction, network structures, and location-allocation models. Role of transport and transport planning.
QP: GEO 213 QA: GEO 409

415. Location Theory and Land Use Analysis

Fall. 3(3-0)
P: GEO 113. R: Not open to freshmen.
Classical and neoclassical, static and dynamic models of industrial location and spatial organization. Land rent theory. Central place theory. Multi-locational organization. Growth transmission.
QP: GEO 213 QA: GEO 435

418. The Ghetto

Fall of odd-numbered years. 3(3-0)
P: GEO 413 or SOC 375 or UP 201 or ISS 320 or MC 343 or MC 384 or approval of department. R: Not open to freshmen and sophomores.
Analysis of the ghetto including its spatial organization and structure. Distribution of racial and ethnic populations. Emphasis on U.S. cities.
QA: GEO 401

423. Map Production and Design

Spring. 4(2-4)
P: GEO 223.
Manual and automated techniques. Design solutions, map planning, overlay construction, user issues, typography, color theory, and color selection.
QP: GEO 223 QA: GEO 446, GEO 456

424. Advanced Remote Sensing

Fall. 4(3-2)
P: GEO 224. R: Not open to freshmen and sophomores.
Interaction of solar radiation with the atmosphere, lithosphere, hydrosphere, and biosphere. Introductory digital image processing. Earth-resources satellite sensors, data products, and applications. Radar and thermal remote sensing.
QP: GEO 224 QA: GEO 424

425. Advanced Geographic Information Systems

Spring. 4(3-2)
P: GEO 225.
Technical and theoretical issues in the design, evaluation, and implementation of geographic information systems for research and application.

426. Topics in Cartographic Research

Fall of even-numbered years. 3(3-0)
P: GEO 223.
Major research trends in modern cartography. Map perception, cognition, and innovation. Library work, proposal and paper writing, cartographic experimentation, and oral presentation.
QP: GEO 223 QA: GEO 447

435. Geography of Health and Disease

Fall. 3(3-0)
R: Not open to freshmen, sophomores, juniors.
Spatio-environmental concepts and techniques applied to health problems. Disease transmission cycles, community nutrition, and health-care planning.
QA: GEO 470

452. Population and Development

Spring of even-numbered years. 3(3-0)
P: GEO 113 or GEO 151 or GEO 230 or GEO 233 or GEO 335 or GEO 336 or GEO 337.
Demographic issues related to economic development and environmental sustainability in selected world regions.
QP: GEO 201, GEO 213, GEO 300, GEO 315, GEO 316, GEO 321, GEO 322, GEO 340, GEO 342, GEO 360, GEO 364, GEO 365 or GEO 407 QA: GEO 320

454. Spatial Aspects of Regional Development

Spring of even-numbered years. 3(3-0)
P: GEO 113, or GEO 151, or GEO 230, or GEO 233, or GEO 335, or GEO 336, or GEO 337.
Spatial patterns and processes associated with regional development in selected world areas.
QP: GEO 201, GEO 213, GEO 300, GEO 315, GEO 316, GEO 320, GEO 321, GEO 322, GEO 340, GEO 342, GEO 360, GEO 364 or GEO 365 QA: GEO 440

459. Tourism and Regional Development

Spring of even-numbered years. 3(3-0)
P: GEO 259 or PRR 213.
The role of tourism in regional development. Examples from Michigan, and the United States and other nations. Environmental considerations.

463. Introduction to Quantitative Methods for Geographers and Planners

Fall. 3(3-0) Interdepartmental with Urban Planning.
P: Completion of University mathematics requirement.
R: Open only to majors in Geography, Urban Planning, and Landscape Architecture.
Quantitative techniques in the analysis and classification of spatial data.
QA: GEO 427

480. Senior Seminar

Fall. 3(3-0)
R: Open only to seniors in Geography.
History, philosophy, and methodology of the geographic discipline as it has evolved within academic and social contexts.
QA: GEO 425

490. Independent Study
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
R: Approval of department.
Supervised individual study in an area supplementary to regular courses.

492. Geographic Research Problems
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
R: Not open to freshmen and sophomores. Approval of department.
Supervised original research on selected aspects of geography.

495. Field Study
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course.
R: Not open to freshmen and sophomores. Approval of department.
Supervised field study in geography.

498. Internship in Geography
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course.
R: Open only to juniors and seniors. Approval of department.
Individual experience in geography in an approved organization.

809. Topics in Physical Geography
Spring. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course.
Review of research on topics in physical geography such as climatology, geomorphology, soils, or plant geography.
QA: GEO 834

813. Topics in Urban and Economic Geography
Spring. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course.
P: Two of GEO 413, GEO 414, GEO 415, GEO 416, GEO 417, GEO 418.
Review of research on selected topics in urban and economic geography.
QP: TWO of GEO 401, GEO 403, GEO 435 QA: GEO 805

815. Topics in Location Theory and Transportation Geography
Spring. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course.
P: Two of GEO 413, GEO 414, GEO 415, GEO 416, GEO 417, GEO 418.
Review of research on selected topics in location theory and transportation geography.
QP: TWO of GEO 401, GEO 403, GEO 435 QA: GEO 835

823. Map Automation
Fall of even-numbered years. 3(2-2)
Use of computers in cartography. Cartographic algorithms, interpolation, and line generalization. Program intelligence. Cartographic data bases.
QP: GEO 223 QA: GEO 449

825. Geoprocessing
Fall of odd-numbered years. 4(4-0)
Integration of digital remote sensing data, geographic information systems, spatial analysis, and expert systems in solving research problems. Class research project.
QP: GEO 424

826. Topics in Cartography and Geoprocessing
Spring. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course.
Review of research in cartography, geographic information systems, and remote sensing.
QA: GEO 846

850. Topics in Regional Geography
Fall of even-numbered years, Spring. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course.
Review of research on contemporary geographic issues in different world regions.
QA: GEO 840

865. Advanced Quantitative Methods in Geography
Spring. 4(4-0)
P: GEO 465.
Statistical and mathematical approaches. Multiple regression, principal components and factor analysis, discriminant analysis. Related taxonomic methods.
QP: GEO 427 QA: GEO 811

886. Research Design in Geography
Spring. 3(3-0)
Research and writing in geography. Identification of geographic problems and their relative importance. Structuring and stating hypotheses. Data acquisition and tests for validity.
QA: GEO 826

890. Advanced Readings in Geography
Fall, Spring, Summer. 1 to 8 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
R: Approval of department.
Advanced independent readings.
QA: GEO 818

892. Advanced Research in Geography
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
Advanced independent research.

899. Master's Thesis Research
Fall, Spring, Summer. 1 to 12 credits. A student may earn a maximum of 30 credits in all enrollments for this course.
R: Open only to graduate students in Geography.
QA: GEO 899

986. Theory and Methods in Geography
Spring. 3(3-0)
R: Open only to Ph.D. students in Geography.
Historical development of the discipline within social and intellectual contexts. Current methodological and philosophical approaches to geographic research.
QA: GEO 926, GEO 825

999. Doctoral Dissertation Research
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 36 credits in all enrollments for this course.
QA: GEO 999

303. Oceanography
Fall. 4(4-0)
P: CEM 142 or CEM 152 or PHY 184 or PHY 232 or CEM 141, PHY 183 or CEM 141, PHY 231 or CEM 151, PHY 183 or CEM 151, PHY 231.
Physical, chemical, biological, and geological aspects of oceanography: ocean circulation, waves, tides, air-sea interactions, chemical properties of ocean water, ocean productivity, shoreline processes, and sediments.
QP: CEM 142 or CEM 151 or PHY 289 or PHY 239 or CEM 141, PHY 238 or CEM 151

321. Mineralogy and Geochemistry
Fall. 4(3-2)
P: CEM 142 or CEM 152.
Geochemical properties and processes in the origin, modification, structure, dynamics and history of Earth materials. Crystallography and crystal chemistry. Mineral classification and identification.
QP: CEM 141 or CEM 151 or LBS 161 QA: GLG 321, GLG 323, GLG 327

331. Vertebrate Life of the Past
Spring. 3(3-0) Interdepartmental with Zoology.
P: BS 110 or BS 111 or juniors and above. Not open to students with credit in GLG 493.
Evolution and diversity of fossil vertebrates from fish to humans with emphasis on dinosaurs and Pleistocene events.
QA: GLG 302

351. Structural Geology
Fall. 4(3-2)
P: GLG 201 or GLG 301; GLG 321, MTH 116.
Structural geology. Mechanical behavior and kinematic history of the lithosphere. Stress and strain. Deformation features such as folds, faults and microstructure. Methods of analysis and interpretation. One weekend field trip required.
QP: GLG 202, MTH 111 QA: GLG 351

371. Introduction to Geodynamics and Geophysics
Spring. 3(4-0)
P: MTH 116; PHY 183 or PHY 183B or PHY 231 or PHY 231B.
Geophysical methods of studying the structure and dynamics of the earth and planets. Plate kinematics and global geodynamic processes, plate margin processes and evolution, marine geology.
QP: GLG 201, MTH 112 QA: GLG 375, GLG 479

411. Hydrogeology
Fall. 4(3-2)
P: MTH 116 R: Not open to freshmen and sophomores.
Principles of the source, occurrence and movement of groundwater emphasizing geologic factors and controls.
QP: MTH 109 or MTH 111. QA: GLG 411

412. Glacial and Quaternary Geology
Spring of odd-numbered years. 3(2-2)
Interdepartmental with Geography.
P: GLG 201 or GLG 301 or GEO 406. R: Not open to freshmen and sophomores.
Glacial and Quaternary geology with emphasis on the midwestern United States. Laboratory focuses on glacial processes. One weekend field trip required.
QP: GLG 201 QA: GLG 413

421. Environmental Geochemistry
Spring. 3(3-0)
P: GLG 201 or GLG 301; CEM 141 or CEM 151.
Natural and anthropogenic processes affecting environmental chemistry with emphasis on the water cycle. Chemical equilibria, kinetics, geochemical cycling, acid rain, carbon dioxide and the greenhouse effect. Historical perspectives and future concerns.
QP: GLG 200 or GLG 201, CEM 151 QA: GLG 412

422. Organic Geochemistry
Fall. 3(3-0)
P: CEM 141 or CEM 152 or CEM 182H; GLG 201 or GLG 301; PHY 183 or PHY 183B or PHY 231 or PHY 231B.
Organic geochemistry applied to global cycling of organic matter and diagenesis. Evaluation of the fate of bulk organic matter and individual compounds in the environment.
QP: CEM 152, GLG 201 or GLG 301, PHY 237 or PHY 287

GEOLOGY GLG

Department of Geological Sciences College of Natural Science

201. Earth Processes and History
Fall, Spring. 4(3-2)
Not open to students with credit in GLG 301.
Physical, chemical and biological processes related to the evolution of the Earth. The roles of solar energy, Earth's internal heat and the process of natural selection in controlling these processes.
QA: GLG 201, GLG 202, GLG 306

301. Engineering Geology
Fall. 4(3-2)
R: Not open to freshmen. Open only to College of Engineering students. Not open to students with credit in GLG 201.
Principles of geology as applied to civil engineering practice. Minerals, rocks, surficial and internal processes, mitigation of destructive geological processes. Air photos, topographic-geologic maps, cross sections.
QA: GLG 200, GLG 201, GLG 306

302. Geology of Michigan
Spring. 3(3-0)
P: GLG 201 or GLG 301 or ISP 203.
Physical, historical, and economic geology of Michigan and its environs.
QP: GLG 200 or GLG 201 or GLG 306