**GEOGRAPHY**

**Department of Geography**

**College of Social Science**

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**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.

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**151 Cultural Geography**

Fall, Spring of even years. 3(3-0)

Systematic approach to the spatial distribution of cultural features, processes, and relationships.

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**203 Introduction to Meteorology**

Fall. 3(3-0)


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**204 World Regional Geography**

Fall. 3(3-0)

In a time of increasing globalization of economic, political, and technological processes, different societies on different continents are responding in various ways. This course explores the conditions that contribute to diversity in different world regions - including economic, social, political and environmental processes.

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**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).

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**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.

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**208 Physical Geography of the National Parks**

Fall of odd years. 2(2-0) Interdepartmental with Park, Recreation and Tourism Resources. Administered by Geography.

Physical features such as geology, landforms, biota, and waters of United States and Canadian national parks, forests, seashores and lakeshores. Emphasis on formation and distribution.

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**221 Introduction to Geographic Information**

Fall, Spring. 3(2-2) SA: GEO 223, GEO 225

Principles and methods of spatial data collection, handling, analysis, and display. Introduction to remote sensing, geographic information systems, and cartography.

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**259 Geography of Recreation and Tourism**

Fall of even 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.

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**306 Environmental Geomorphology**

Spring of odd years, 3(3-0) Interdepartmental with Geological Sciences. Administered by Geography. P: CSS 210 or GEO 206 or GEO 333 or GLG 201 or GLG 304 or ISP 203A

Relationships of running water, weathering, gravity, ice, waves, wind, and biota (including humans) to terrain and soils. Evolution of landscapes. Classical and modern interpretations.

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**314 Methods for Investigation of Urban Systems**

Spring, 4(3-2) Interdepartmental with Urban Planning. Administered by Urban Planning. P: STT 201 and CSE 101

Models, approaches, and techniques for urban and regional problem analysis, research, program evaluation, and project management. Application of related computer software.

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**324 Remote Sensing of the Environment**

Fall. 4(2-4) SA: GEO 224

Features and interpretation methods of remotely-sensed imagery, especially black-and-white and color infrared airphotos. Basic features of radar, thermal, and multispectral imagery. Interpretation for agriculture, archaeology, fisheries, forestry, geography, landscape architecture, planning, and wildlife management.

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**325 Geographic Information Systems**

Fall. 3(2-2) P: GEO 221

Technical, and theoretical issues in the design, implementation, and use of geographic information systems for research and applications.

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**330 Geography of the United States and Canada**

Fall, Spring, Summer. 3(3-0) SA: GEO 230

Regional analysis. Evolution and status of environmental, demographic, economic, and sociocultural patterns and processes.

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**333 Geography of Michigan and the Great Lakes Region**

Spring. 3(3-0) SA: GEO 233

Michigan's physical, historical, and economic geography. Interrelations between the physical environment (rocks, landforms, soils, climate, vegetation, hydrology) and historical and contemporary land uses. Demographic and agricultural patterns. Human history and settlement patterns. Contemporary recreational opportunities.

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**335 Geography of Latin America**

Fall. 3(3-0) P: Completion of Tier I writing requirement. 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 drought, agricultural patterns, hunger, rural development, migration, and urbanization.

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**338 Geography of Africa**

Fall. 3(3-0) P: Completion of Tier I writing requirement. 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.

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**339 Geography of the Middle East and North Africa**

Spring. 3(3-0)


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**363 Introduction to Quantitative Methods for Geographers**

Fall. 3(3-0) RB: Completion of University mathematics requirement. SA: GEO 463

Quantitative techniques in the analysis and classification of spatial data.

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**370 Introduction to Zoogeography**

Fall. 3(3-0) Interdepartmental with Fisheries and Wildlife and Zoology. Administered by Zoology. P: (ZOL 355)

Patterns of geographical distribution of animals and the ecological and historical processes leading to these patterns.

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**401 Geography of Plants of North America**

Spring of even years. 3(3-0) P: GEO 206 R: Not open to freshmen or sophomores.

Geography of Plants in North America, including the ecological processes and human impacts possible for this geography. Opportunity for field study.

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**402 Agricultural Climatology**

Fall of even years. 3(3-0) Interdepartmental with Biosystems Engineering. Administered by Geography. P: MTH 104 or MTH 110 or MTH 116 R: Not open to freshmen or sophomores.

Relationships between climate and agriculture in resource assessment, water budget analysis, meteorological hazards, pests, crop-yield modeling, and impacts of global climate change.

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**405 Weather Analysis and Forecasting**

Spring of odd years. 4(3-2) P: GEO 203 and (MTH 110 or 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.

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**407 Regional Geomorphology of the United States**

Spring of odd years. 3(3-0) P: GEO 306 or GLG 201 or GLG 412 or ISP 203A or ISP 203B

Geomorphologic characteristics of physiographic regions of the United States.

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**408 Soil Geomorphology Field Study**

Fall. 4(2-4) P: CSS 210 or GEO 306 or GLG 201 or GLG 412 or ISP 203A or ISP 203B R: Not open to freshmen or sophomores.

409 Global Climate Change and Variability
Fall of odd years. 3(0-0) P: GEO 206
Analysis of climate change and variability at various time and space scales. Climate systems, paleoclimatology, global warming, climate models, and climate impact assessment.

410 Geography of Food and Agriculture
Fall. 3(3-0) P: Completion of Tier I Writing Requirement RB: GEO 113 or GEO 151 or GEO 204 or GEO 206 or ISS 310 R: Not open to freshmen or sophomores.
Spatial patterns of contemporary global agriculture and food systems. Human-environment geography of select agricultural practices and food systems. Effects of agricultural practices on natural and human resources.

412 Glacial Geology and the Record of Climate Change
Spring. 4(3-2) Interdepartmental with Geological Sciences. Administered by Geology. RB: GLG 201 or GEO 306 or GEO 408 R: Not open to freshmen or sophomores.
In-depth analysis of glacial geology and the record of climate change, with emphasis on North America and Europe. Laboratory focuses on glacial processes. One weekend field trip required.

413 Urban Geography
Spring. 3(3-0) Interdepartmental with Urban Planning. Administered by Geography. R: Not open to freshmen or 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.

414 Geography of Transportation
Fall of odd years. 3(3-0) Interdepartmental with Urban Planning. Administered by Geography. 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.

415 Location Theory and Land Use Analysis
Fall. 3(3-0) Interdepartmental with Urban Planning. Administered by Geography. P: GEO 113 or UP 201 RB: One of the prerequisites or an introductory ECON course. R: Not open to freshmen or sophomores.
Classical and neoclassical, static and dynamic models of industrial location and spatial organization. Land rent theory. Central place theory. Multi-locational organization. Growth transmission.

416 The Ghetto
Fall of odd years. 3(3-0) Interdepartmental with Urban Planning. Administered by Geography. R: Not open to freshmen or sophomores.
Analysis of the ghetto including its spatial organization and structure. Distribution of racial and ethnic populations. Emphasis on U.S. cities.

419 Applications of Geographic Information Systems to Natural Resources Management
Spring. 4(2-4) Interdepartmental with Community, Agriculture, Recreation and Resource Studies and Biosystems Engineering and Forestry and Fisheries and Wildlife. Administered by Fisheries and Wildlife. P: GEO 221
Application of geographic information systems, remote sensing, and global positioning systems to integrated planning and management for fish, wildlife, and related resources.

423 Cartographic Design and Production
Fall. 4(2-4) P: GEO 221
Elements of map design including planning, layout, typography, color theory and selection, and user issues. Techniques of map production, for both printed and electronic display.

424 Advanced Remote Sensing
Spring. 4(3-2) RB: GEO 324
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.

425 Problems in Geographic Information Science (W)
Spring. 3(2-2) Interdepartmental with Urban Planning. Administered by Geography. P: GEO 325 or GEO 492
Advanced theoretical and technical issues in geographic information science utilizing a problems oriented approach. Development and implementation of geographic information science solutions and formal documentation of work.

426 Thematic Cartography
Spring of even years. 4(3-2) P: GEO 221 SA: GEO 326
Principles, techniques, and decision making in thematic mapping. Use of computer-mapping and geographic information systems (GIS) software to produce individual thematic maps and map series. Electronic delivery of thematic maps.

428 Digital Terrain Analysis
Fall of even years. 4(3-2) P: GEO 221 and GEO 325 R: Open to juniors or seniors. Theoretical and technical issues of collection, management, analysis, and display of terrain data. Application of photogrammetry, geographic information systems, and cartography.

432 Environmental Ethics (W)
Fall. 3(3-0) P: Completion of Tier I writing requirement. R: Open only to juniors or seniors. Ethical dimensions of environmental and spatial issues and associated public policies.

433 Geography of Michigan Field Study
Summer of even years. 3 credits. P: GEO 333 or approval of department
Field study of Michigan’s physical, agricultural, and urban landscapes. Interactions with representatives of agriculture, industry, and government.

435 Geography of Health and Disease
Fall. 3(3-0) R: Not open to freshmen or sophomores.
Spatio-environmental concepts and techniques applied to health problems. Disease transmission cycles, community nutrition, and health-care planning.

436 Spatial Analysis of Populations
Spring. 3(3-0) R: Not open to freshmen or sophomores.
Concepts and methods to measure and evaluate geo-spatial and temporal trends in populations and their components, such as natality, mortality, migration, and characteristics at different geographic scales. Sources of spatial population data. Visualization and analysis of data in a geographical information system.

440 Critical Geopolitics
Spring of even years. 3(3-0) R: Not open to freshmen.

441 Geography of Language and Religion
Spring of odd years. 3(3-0) R: Not open to freshmen.
Geographic survey of world languages and religions in terms of their origins, diffusions, and changes, their ecological relationships, and their impacts on spatial organization.

450 Smart Growth and Strategic Land Use Decision Making
Fall. Spring. 3(3-0) Interdepartmental with Environmental Economics and Policy and Environmental Studies and Applications and Urban Planning. Administered by Environmental Studies and Applications. RB: EC 201 or UP 201 or GEO 113 R: Not open to freshmen or sophomores.
Theories and models of smart growth and strategic land use planning and decision making. Intergovernmental coordination, regional socioeconomic development and environmental sustainability. Land use research and leadership development.

453 Metropolitan Environments: Urban Forms and Land Uses
Spring. 3(2-2) P: GEO 221
Land use change, the physical fabric of the city, and the growth of regional centers in the American urban landscape. Issues associated with urban developments, practices and patterns in the 20th century and the resulting metropolitan form and function. Extensive use of geographic information software in spatial analysis.

454 Geography of Environment and Development
Spring of odd years. 3(3-0) P: GEO 113 or GEO 151 or GEO 330 or GEO 333 or GEO 335 or GEO 336 or GEO 337 or GEO 338
Spatial patterns and processes associated with regional development in selected world areas.

459 Tourism in Regional Development
Spring of odd years. 3(3-0) RB: GEO 259 or PRR 213
The role of tourism in regional development. Examples from Michigan, and the United States and other nations. Environmental considerations.

478 Urban Transportation Planning
Spring. 3(3-0) Interdepartmental with Urban Planning. Administered by Urban Planning. R: Open only to juniors or seniors in the Urban and Regional Planning major or Geography major or approval of department.
Principles of decision-making in urban transportation planning. Demand and supply analysis, social and environmental impacts, implementation programs. Use of computer models.
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866  Spatial Data Analysis
Spring. 4(3-2) Interdepartmental with Statistics and Probability. Administered by Geography. RB: (GEO 463 or STT 421 or STT 430) or equivalent quantitative methods courses SA: GEO 466
Theory and techniques for statistical analysis of point patterns, spatially continuous data, and data in spatial zones.

868  Spatial Regression and Modeling
Fall. 3(3-0) P: GEO 865 or approval of department RB: Linear regression and data analysis at graduate level SA: GEO 867

871  Seminar in Physical Geography
Fall. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course. RB: at least one course in physical geography R: Approval of department.
Research in topics in physical geography.

872  Seminar in Human Geography
Fall. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course. RB: at least one course in human geography R: Approval of department.
Research in topics in human geography.

873  Seminar in Human-Environment Geography
Spring. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course. RB: at least one course in human geography and one course in physical geography. R: Approval of department.
Research in topics in human-environment geography.

874  Seminar in Geographic Information Science
Spring. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course. RB: at least one course in geographic information science, cartography or remote sensing. R: Approval of department.
Geographic information science (GIS) applications to social and environmental problems. Theory and related issues.

875  Tourism and Global Change
Spring of odd years. 3(3-0) Interdepartmental with Community, Agriculture, Recreation and Resource Studies. Administered by Community, Agriculture, Recreation and Resource Studies.
Inter-relationship among tourism and economic, social, political, and environmental forces. Local, national, and international levels. Focus on vulnerable, less developed regions with the lowest natural levels of adaptation to global, social, and environmental change.

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.

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.

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 99 credits in all enrollments for this course. R: Open only to graduate students in the Geography major.
Master's thesis research.

986  Theory and Methods in Geography
Spring. 3(3-0) R: Open only to doctoral students in the Geography major.
Historical development of the discipline within social and intellectual contexts. Current methodological and philosophical approaches to geographic research.

999  Doctoral Dissertation Research
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 99 credits in all enrollments for this course.
Doctoral dissertation research.