

GEOGRAPHY

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Advisers:

Miyares (Geography, Social Studies Education), Salmun (Environmental Studies)

HEGIS Codes: 2206 (Geography); 2205 (Adolescence Education); 4999 (Environmental Studies)

Majors Offered	Options in Degree	Number Credits	Recommended/ Required GER	Recommended Minor
BA in Geography		30+3 credits of program prerequisites (GEOG 101)	Recommended: GEOL 101, 102, STAT 113 or 213 to satisfy a portion of the GER	Any minor from any department in the college leading to a BA degree It is recommended that students choose a minor that is closely related to their particular interest in geography.
	Social studies for childhood education	30+9 credits of program prerequisites HIST 151, HIST 152 and (GEOG 101)	HIST 151 HIST 152 GEOG 101 (program prerequisites)	Childhood education, QUEST, serves as a collateral major in place of a minor
	Social studies for adolescence education	36+9 credits of program prerequisites (HIST 151, HIST 152 and GEOG 101)	HIST 151 HIST 152 GEOG 101 (program prerequisites)	Adolescence education sequence
BA in Environmental Studies	1. Environmental Earth Science 2. Environmental Management and Policy	39-41 + course pre-reqs	Recommended: GEOL 101, 102, STAT 113 or 213 to satisfy a portion of the GER	Students may select a concentration within Biology, Chemistry, Computer Science, Economics, Mathematics/Statistics, Physics, Political Science, or Urban Studies.

The department offers courses in human geography, physical geography, earth systems science, geographic techniques and methods and geology. Students may major in geography, social studies education options within geography or environmental studies; and they may minor in geography, environmental studies or geology. These areas provide preparation for both graduate study and immediate employment. Courses in all of these fields are valuable parts of a general liberal education, developing an awareness of earth phenomena and the role these play in people's lives.

The Center for Geographic Learning was established in 2004. At the undergraduate level in association with the Hunter College School of Education and the New York City Department of Education, the Center will help prepare students who wish to become teachers of social studies or earth science. See "Options in Social Studies Education within the Geography Major" and "Preparation for Graduate Work in Teaching Earth Science", below.

The social studies education options prepare students for a career in teaching social studies at the grades 1-6 or 7-12 levels. The geography major with electives in PGEOG/GTECH and a minor in one of the sciences prepares students to pursue further study leading to a career in teaching earth science. Many of these courses are concerned with the environmental problems that are of so much concern today and can provide part of a well-rounded program of environmental studies.

Revisions in the curricula within the Department of Geography that are currently under way may involve modifications in various requirements. Please consult with the department office for up-to-date information and requirements.

Preparation for Teaching

In cooperation with the School of Education, the department provides opportunities for students to prepare for a career in education. Students interested in this career track should consult the Education pages of this catalog. The following routes are available to qualified students:

- Option in Social Studies within the Geography Major for Childhood Education Teachers, grades 1-6 (see listing under Program in Geography).
- Option in Social Studies within the Geography Major for Adolescence Education Teachers, grades 7-12 (see listing under Program in Geography).
- Preparation for the MA program for Teachers of Earth Science (grades 7-12) with a concentration in physical geography, geology, earth science or environmental science (see listing under Program in Geology).

PROGRAM IN GEOGRAPHY

Students who expect to do graduate work in geography are advised to take courses in statistics and/or computer science. We suggest, but do not require, that those planning to continue to the doctoral level fulfill the GER Foreign Language Requirement with the language of the area of regional specialization.

Major in Geography

(30 cr)

PGEOG 130	4 cr
GTECH 201	4 cr
GEOG 221	4 cr
One regional geography course	3 cr

A minimum of 15 additional credits consisting of 0-6 credits selected from 200-level courses with a PGEOG, GTECH, GEOG or GEOL prefix; and a minimum of 9 credits selected from 300-level courses with a PGEOG, GTECH or GEOG prefix (except GEOG 391, 392 and 393 and PGEOG 391, 392 and 393) or LACS 330.

It is recommended, but not required, that geography majors use GEOL 101, 102, STAT 113 or 213 to satisfy a portion of the General Education Requirement.

Note that GEOG 101 is a prerequisite to GEOG 221, but does not count toward the major.

Minors

Geography majors may minor in a wide variety of fields but must secure permission from their major adviser. For students preparing to become teachers of social studies, education is an appropriate minor. For students wishing to concentrate in the areas of geomorphological studies, environmental geology or environmental geoscience, it is recommended that a minor in geology, composed of 200- and 300-level GEOL courses, be selected and appropriate courses from cognate fields be used to satisfy general education and elective credit requirements. For information concerning approved courses in the minor, students should consult a departmental adviser.

Minor in Geography for Non-Majors

A minor in geography consists of a minimum of 12 credits approved by the student's major department. Because of the nature of this field of study, geography is a very appropriate minor for major programs. By choosing a concentration from any of the three course prefixes (GEOG, PGEOG or GTECH) or by combining courses from two or more prefixes, a student will be able to create a focused program of study that will enhance that student's major. For specific recommendations see the Geography undergraduate adviser.

Options in Social Studies Education within the Geography Major

1. Option in Social Studies within the Geography Major for Childhood Education Teachers

Program Prerequisites9 credits

- HIST 151 The United States from the Colonial Era to the Civil War3
- HIST 152 The United States from the Civil War to the Present3
- GEOG 101 People and Their Environment ..3

Required Courses18 credits

- HIST 111 World History to 15003
- HIST 112 World History from 1500 to the Present3
- GEOG 241 Population Geography3
- GEOG 251 Geography of the United States and Canada3
- GEOG 260 Geography of New York State ..3
- POLSCI 111 American Government and Politics3

Elective Courses9 credits

Choose any three of the following (at least one in History):

- HIST 353 History of New York City
- HIST 358 20th Century United States3
- GEOG 341 Urban Geography3
- GEOG 342 Geography of International Migration and Ethnicity3
- GEOG 347 Cultural Geography3

Required Capstone Course.....3 credits:

- GEOG 380 Seminar in Geographic Concepts and Methodology3

2. Option in Social Studies within the Geography Major for Adolescence Education Teachers

In cooperation with the School of Education, the Department of Geography provides opportunities for students to prepare for a career in teaching social studies in grades 7-12. In addition to mandatory course work provided by the School of Education, interested students should complete the course of study outlined below. At least 18 credits of these courses or equivalents must be satisfactorily completed (grade of C or better) before the student enrolls in the social studies methods courses. These courses may also be used to satisfy Core and Pluralism and Diversity requirements. Refer to the section in this catalog specific to programs in the School of Education. Transfer stu-

dents who enter Hunter College with more than 90 credits or who will exceed 90 credits in completing the prerequisites for this option in the Geography major, cannot apply for the Adolescence Education program of the School of Education. They may still complete this option within the Geography major but must complete a Master of Arts degree in Adolescence Education before certification as a New York State teacher.

Prerequisites for the Major9 credits

- HIST 151 The United States from the Colonial Era to the Civil War3
- HIST 152 The United States from the Civil War to the Present3
- GEOG 150 World Regional Geography3

Requirements for the Major36 credits

- POLSCI 111 Introduction to American Government and Politics3
- ECON 100 Introduction to Economics3
- GEOG 241 Population Geography3
- GEOG 251 Geography of the United States and Canada3
- HIST 111 World History to 1500.....3
- HIST 112 World History from 1500 to the Present3

Two of the following history courses (at least one at the 300 level):

- HIST 250.66 Introduction to Caribbean History3
- HIST 277 Asian Civilization3
- HIST 278 Modern Asian Civilization3
- HIST 288 History of Africa to the 19th Century3
- HIST 289 Africa in the 19th and 20th Centuries3
- HIST 317 History of the American City.....3
- HIST 353 History of New York City3

Two of the following geography courses (at least one at the 300 level):

- GEOG 270 Mexico, Central America and the Caribbean3
- GEOG 271 South America3
- GEOG 275 Sub-Saharan Africa.....3
- GEOG 277 East Asia.....3
- GEOG 278 Russia and Central Asia3
- GEOG 328 Urban Environmental Problems: Evaluations and Solutions
- GEOG 341 Urban Geography3
- GEOG 342 Geography of International Migration and Ethnicity3

One 3-credit course in cultural anthropology (ANTHC) or sociology3

Capstone course:

- GEOG 380 Seminar in Geographic Concepts and Methodology3

ENVIRONMENTAL STUDIES MAJOR

The Environmental Earth Science concentration is structured to promote an intensive understanding of contemporary physical science, specifically earth system science, as it relates to environmental issues. The Environmental Management and Policy concentration is structured to promote an intensive understanding of a system-based approach to the dynamic nature of human-environmental interactions particularly as manifest in contemporary politics and economics.

A. Environmental Earth Science Concentration

Required courses

- CHEM 102/103 General Chemistry I4.5*
- CHEM 104/105 General Chemistry II4.5*
- GEOG 226 Environmental Conservation: Resource Management 3
- PGEOG 250 Earth System Science I 3
- PGEOG 251 Earth System Science II3

Capstone course:

- PGEOG 490 Honors3
- or
- PGEOG 498 Internship5

Total required credits21-23

* CHEM102/103 plus CHEM 104/105 constitute one year of general chemistry for science majors

Electives:

A minimum of 18 credits from the list below. 12 credits must be taken at the 300-level or higher. Electives are not counted towards the minor requirements.

Note: It is strongly recommended that students take STAT 113 Probability and Statistics.

- GEOG 205 Environmental Geology3
- GEOG 280 Marine Geology3
- GEOG 380 Advanced Oceanography: Chemistry and Physics of Oceans3
- GEOG 383 Special Topics in Geology and Oceanography.....3
- GTECH 201 Introduction to Mapping and GIS4
- GTECH 321 Remote Sensing4
- GTECH 361 Geographical Information Science I3
- PGEOG 313 Biogeography 3
- PGEOG 332 Introduction to Hydrology3
- PGEOG 335 Urban and Metropolitan Coasts.....3
- PGEOG 361 Global Climate Change3
- PGEOG 363 Environmental Hazards3
- PGEOG 383 Special Topics in Environmental Studies3

Total credits39-41

B. Environmental Management and Policy Concentration

Required courses:

CHEM 102/103 General Chemistry I	4.5*
CHEM 104/105 General Chemistry II	4.5*
GEOG 226 Environmental Conservation: Resource Management	3
PGEOG 250 Earth System Science I	3
PGEOG 251 Earth System Science II	3

Capstone course:

PGEOG 490 Honors	3
or	
PGEOG 498 Internship	5

Total required credits21-23

*CHEM102/103 plus CHEM 104/105 constitute one year of general chemistry for science majors

Electives:

A minimum of 18 credits from the list of courses below. 12 credits must be taken at the 300-level or higher. Elective are not counted towards the minor requirements. Courses not listed may be included in a student's concentration with permission of the ES adviser.

Note: It is strongly recommended that students take STAT 113 Probability and Statistics.

COMHE 325 Environmental Public Health Problems.....	3
GEOG 241 Population Geography	3
GEOG 328 Urban Environ. Problems: Evaluations & Solutions	3
GEOG 335 International Pollution Issues	3
GEOG 341 Urban Geography.....	3
GEOG 370 Geography of Sustainable Development	3
GEOG 371 Rural Water Supply in Developing Regions	3
GEOL 205 Environmental Geology	3
GEOL 334 Coastal Geomorphology	3
GEOL 383 Special Topics in Geology and Oceanography	3
GTECH 321 Remote Sensing	3
GTECH 385 GIS Applications	3
HIST 774 History of the Environmental Movement.....	3*
PGEOG 313 Biogeography	3
PGEOG 335 Urban and Metropolitan Coasts.....	3
PGEOG 361 Global Climate Change	3
PGEOG 363 Environmental Hazards	3
PGEOG 383 Special Topics in Physical Geography	3
POLSC 244 Energy & Environ. Politics and Public Policy.....	3
SOC 361 Development and Modernization	3
URBS 310 Methods of Urban Research & Policy Analysis	3
URBS 401 Managing the Urban Physical Environment	3
URBS 734 Environmental Planning.....	3*

Total credits to satisfy Environmental Studies Major with this concentration39-41

*Graduate course. See 2003-2006 graduate catalog. Available to upper seniors or with instructor permission. Students who wish to take a 700-level course to satisfy the major must obtain permission from both the environmental studies adviser and the offering department.

Internships

Students can receive from one to four credits for internships in government agencies, consumer and activist groups, business and industry and media organizations involved in energy issues (e.g., Council on the Environment of NYC, Energy Task Force, NY State Assembly, Sierra Club, International Earthcare Center, NY State Department of Energy, Brooklyn Union Gas, NYC Department of Environmental Protection and the American Museum of Natural History).

Minors for Environmental Studies Majors

The course requirements for minors can be modified only in consultation with and approval of the program adviser. Minors in disciplines not listed are possible only with permission of the program adviser. Courses taken for the minor may not also be counted towards the elective requirements:

Courses	Credits
Biology: BIOL 100, 102, 250 or 304	12
Chemistry: CHEM 120/121, CHEM 222/223, CHEM 376 or 295	12-13
Computer Science: CSCI 135, 235, 335, 340 or 435.....	12
Economics: ECO 200, 201, 330, one additional course with adviser approval.....	12
Mathematics/Statistics: MATH 125, 126, 150, 153, 160	12.5
STAT 212, 213, 214	13
Physics: PHYS 110 or PHYS 111, PHYS 120 or PHYS 121 and one intermediate or advanced level PHYS course.....	12-15
Political Science: POLSC 111 or 211, POLSC 244, 273, 348	12
Urban Studies: URBS 310, 401, 723, 734	12

Note: These courses maintain prerequisites and/or conditions of instructor's permission. 700-level courses are typically open only to upper seniors.

Minor in Environmental Studies for Non-Majors

The minor consists of a minimum of 12 credits approved by the student's major department that may include any required or elective course for the environmental studies major.

Minor in Geology for Non-Majors

A minor in geology consists of 12 credits selected from GEOL prefix courses, PGEOG 231, 334 and GTECH 350 and approved by the student's major department. If after taking a number of geology courses at Hunter, a student wishes to concentrate in geology, it is recommended that the student transfer to a unit of CUNY offering a geology major or take courses on permit at other CUNY units as elective credits.

Preparation for Graduate Work in Teaching Earth Science

For students planning to pursue an MA degree for teachers of earth science, grades 7-12, it is recommended that they complete the following undergraduate work: a baccalaureate degree with a grade point average of 2.8 or better in their science courses and in their overall undergraduate work; a major of at least 30 credits in arts and sciences.

At least 21 credits in geology, physical geography, earth science or environmental science, including geographic techniques; general education core in the liberal arts and sciences that includes 6 credits in English, 6 credits in mathematics/technology, 6 credits in social studies (to include at least one course in U.S. history or geography), 6 credits in the arts and 6 credits in a language other than English. It is recommended, but not required, that the criteria above be satisfied using electives selected from GEOL, PGEOG and GTECH courses; a minor in geology; GER core requirement laboratory science chosen from chemistry, physics or biology and GER core requirement non-laboratory science chosen from astronomy, oceanography, statistics or mathematics. For further information on the education requirements, students should see an adviser in the School of Education.

Honors Work and Individual Study

To graduate with departmental honors, a major in the geography or environmental studies program must be admitted to GEOG 490 or PGEOG 490 and have a 3.0 cumulative GPA and a 3.5 GPA in the major. GEOG 391, 392, 393; GEOL 391, 392, 393; and PGEOG 391, 392, 393 also offer students the opportunity of undertaking individual research in geography, geology or environmental studies.

Fieldwork

Several courses offer students an opportunity to study geography, geology and environmental situations in the field. They are usually offered during intersession periods, summer session or on weekends (consult Schedule of Classes). In addition to the regular field courses, special-topic field courses are offered periodically and fieldwork is conducted in connection with a number of the other courses. The department participates in the Study Abroad Program. It offers a field geography of selected world regions course (check with adviser for current location). An additional fee for transportation, lodging and food allowance is attached to these courses, depending on the focus of the course and its itinerary.

Graduate Study

Graduate-level courses may be taken for credit toward the bachelor's degree by highly qualified seniors. Written permission must be obtained from the undergraduate and graduate advisers.

Intern Program

Internship (GEOG 498, PGEOG 498) provides opportunities for qualified majors and minors in both geography and environmental studies to work in positions of responsibility in professional institutions while earning from 1 to 4 academic credits. See a departmental adviser for details.

Study Abroad/National Student Exchange Programs

The department is a participant in these programs and offers courses periodically outside of New York City. See a departmental adviser for details.

COURSE LISTINGS

Fieldwork requiring an additional fee for transportation may be required in any course and will be collected prior to the trip by a departmental representative.

GEOGRAPHY

GEOG 101 People and Their Environment GER 2/B

Survey of earth environment (atmosphere, land, water); how it varies spatially and how people interact with it. Contemporary economic, political and social patterns and problems are discussed.
3 hrs, 3 cr.

GEOG 150 World Regional Geography GER 2/B PD/A or D

A survey of the world's major regions. Geographic concepts and principles are used to study the physical, economic, social and political conditions and problems in the culturally diverse world. Spatial expression of culture; specialized behavior patterns; adaptations and way of life in distinct environments. Regional interdependence; implications for development.
prereq: ENGL 120
3 hrs, 3 cr.

GEOG 221 Economic Geography GER 3/B

Not open to freshmen. Geographic factors influencing economic activity. Spatial organization of society. Location theories are stressed. Locational and commodity flow; analysis; regional economic development.
prereq: GEOG 101 or perm instr.
5 hrs (3 lec, 2 lab), 4 cr.

GEOG 226 Environmental Conservation: Resource Management GER 3/B

Resources in relation to population. Policies, practices and constraints in natural resources development. Energy crisis.
3 hrs, 3 cr.

GEOG 227 Environmental Conservation: Urban Problems GER 3/B

Impact of people on nature, spatial distribution, quality and adequacy of major physical resources of urban areas.
3 hrs, 3 cr.

GEOG 241 Population Geography GER 3/B PD/B or C

Geographic aspects, interpretation and analysis techniques of fertility, mortality and migration. Population growth in relation to resource bases. Processes and impacts of immigration and urban ethnicity. One section is offered in January intersession in Hawaii.
prereq: GEOG 101 or 150 or perm instr.
3 hrs, 3 cr.

GEOG 251 Geography of the United States and Canada GER 3/B

Analysis of the relationship of natural environment to economic, social and political life of North America. Emphasis on U.S.
prereq: GEOG 101 or perm instr.
3 hrs, 3 cr.

GEOG 260 Geography of New York State GER 3/B

Analysis of relationship of natural environment to economy and settlement pattern of the state. Land use, environmental problems.
prereq: GEOG 101 or perm instr.
3 hrs, 3 cr.

GEOG 270 Regional Geography of Mexico, Central America and the Caribbean GER 3/B PD/A

Analysis of relationship of natural environment to economic, social and political life of Mexico, Central America and West Indies.
3 hrs, 3 cr.

GEOG 271 Regional Geography of South America GER 3/B PD/A

Analysis of relationship of natural environment to economic, social and political life of South America.
3 hrs, 3 cr.

GEOG 274 Regional Geography of the Middle East and North Africa GER 3/B PD/A

Analysis of relationship of natural environment to economic, social and political life of Middle East and North Africa.
3 hrs, 3 cr.

GEOG 275 Regional Geography of Sub-Saharan Africa GER 3/B PD/A

Analysis of the relationship of natural environment to economic, social and political life of Africa south of Sahara.
3 hrs, 3 cr.

GEOG 277 Regional Geography of East Asia GER 3/B PD/A

Analysis of East Asia's potentials in terms of natural resources, population, industry and agriculture, with emphasis on China.
3 hrs, 3 cr.

GEOG 278 Regional Geography of Russia and Central Asia GER 3/B PD/A or D

Analysis of the relationship of the natural environment to economic, social and political life of Russia, the former Soviet republics of Central Asia and Mongolia.
3 hrs, 3 cr.

GEOG 321 Transportation Geography GER 3/B

A geographic study and modeling of transportation routes and their influences on the location of economic activity.
prereq: GEOG 221 or perm instr.
3 hrs, 3 cr.

GEOG 328 Urban Environmental Problems: Evaluations and Solutions GER 3/B

Open to Jr/Sr only. The special environmental problems of urban and metropolitan areas will be studied, including water supplies, waste management, environmental impact and waterfront use. Natural physical processes, methodologies and techniques will be reviewed and applied to decision making. Transportation fee for field work may be required.
prereq: GEOG 101 or URBS 102 or GEOL 101;
3 hrs, 3 cr.

GEOG 334 Political Geography GER 3/B

Open to Jr/Sr only. Impact of environment on centrifugal and centripetal forces involved in well-being of states. Nation-states; law of the seas.
prereq: GEOG 101
3 hrs, 3 cr.

GEOG 335 International Pollution Issues GER 3/B

A study of international transboundary pollution and the science, source terms, transport pathways and international impacts of contamination events. The regional focus will change yearly pending current global environmental events.
prereq: GEOG 101 or GEOL 101 or PGEOG 130 or perm instr.
3 hrs, 3 cr.

GEOG 341 Urban Geography GER 3/B

Open to Jr/Sr only. Spatial analysis of functions of metropolitan areas. Social and economic characteristics of cities and suburbs. Land use and transportation patterns.
prereq: GEOG 101 or perm instr.
3 hrs, 3 cr.

GEOG 342 Geography of International Migration and Ethnicity PD/B

Quantitative and qualitative examination of historic and contemporary international migration patterns. Spatial demographic impacts of immigration policy in the United States with a focus on major urban centers. Comparative analysis of ethnic and racial minorities in the United States.
prereq: GEOG 241 or perm instr.
3 hrs, 3 cr.

GEOG 343 Urban Geographic Theory GER 3/B

Spatial analysis of contemporary and theoretical issues concerning the economic growth, transportation, land use, social segregation and political fragmentation in metropolitan areas.
prereq: GEOG 341 or equiv.
3 hrs, 3 cr.

GEOG 347 Cultural Geography GER 3/B

Open to Jr/Sr only. Environmental impact of culture. Diffusion theory. Culture groups; language; architecture; landscapes. Perception.
prereq: GEOG 101 or perm instr.
3 hrs, 3 cr.

GEOG 357 Geography of New York City and Vicinity GER 3/B

Open to Jr/Sr only. An analysis of the relationship of the natural environment to the economic and settlement pattern of the New York metropolitan region over time, with emphasis on New York City.
prereq: GEOG 101
3 hrs, 3 cr.

GEOG 370 Geography of Sustainable Development in Developing Countries GER 3/B PD/A

Analysis of factors that influence sustainable development, e.g., available resources, environment, population, food production and water supply in developing countries.
prereq: one of the following: GEOG 101, 150, 270, 271, 275, 277 or perm instr.
3 hrs, 3 cr.

GEOG 371 Rural Water Supply in Developing Regions

GER 3/B PD/A

The quality, problems, management and sustainability of rural water supply and sanitation in developing countries.

prereq: GEOG 101, 150, 270, 271, 275, 277 *or perm instr.*
3 hrs, 3 cr.

GEOG 372 Field Geography of Peru

GER 3/B

Regional field study of the geography of Peru. Topics include physical, environmental, historical, cultural, urban, political, agricultural, religious and economic geographies in various ecological zones. Taught in English. Fee for transportation and accommodations required. Completing GEOG 101 or GEOL 101 or PGEOG 130 prior to enrollment is strongly recommended.

prereq: acceptance into Peru Study Abroad Program

coreq: GEOG 271 *or dept. perm.*
90 hrs of fieldwork, 3 cr.

GEOG 380 Seminar in Geographic Concepts and Methodology

GER 3/B

Open to Jr/Sr only. Investigations of evolution, conceptual framework and methodological approaches of modern geography.

prereq: perm instr.
3 hrs, 3 cr.

GEOG 381, 382, 383 Special Topics in Geography

GER 3/B

Open to Jr/Sr only. Topics to be announced.

prereqs: GEOG 101, 200-level course of which special topic is logical outgrowth, *perm instr.*
1-4 hrs (lec or lec/lab), 1-3 cr.

GEOG 391, 392, 393 Individual Study in Geography

Individual studies and readings, with lab or fieldwork where appropriate, carried out under faculty guidance.

prereqs: 2 sem of geography, *perm dept.*
1-3 cr.

GEOG 490 Honors in Geography

Upper Jr/Sr geography majors only. Individual research to be carried on under faculty guidance. Results must be embodied in an honors essay or equivalent.

prereq: perm dept.
1 sem, 3 cr.

GEOG 498 Internship

Open to qualified geography majors and minors, upper Jr/Sr only. Opportunities for working in positions of responsibility in professional institutions for academic credit. See undergraduate adviser.

1-4 cr.

PHYSICAL GEOGRAPHY**PGEOG 130 Weather and Climate**

GER 2/E

Principles of meteorology and climatology; elements of weather; current weather analysis; weather maps; forecasting; patterns and characteristics of world climate, climatic change.

5 hrs (3 lec, 2 lab), 4 cr.

PGEOG 231 Physical Geography II: Principles of Geomorphology

See GEOL 231

PGEOG 250 Earth System Science I

GER 3/B

Examination of the earth, including the atmosphere, hydrosphere, lithosphere and biosphere, as a system.

prereq: at least one 100-level science course. *or perm instr.*
3 hrs, 3 cr.

PGEOG 251 Earth System Science II

GER 3/B

Examination of the earth as a system, with a focus on long- and short-term climate dynamics and global impacts of air and water pollution.

prereq: PGEOG 250 *or perm instr.*
3 hrs, 3 cr.

PGEOG 313 Biogeography

GER 3/B

Study of spatial and temporal patterns of biodiversity over the face of the earth and their causes. Completion of PGEOG 250/251 and GTECH 373 prior to enrollment is strongly recommended.

prereq: PGEOG 130, GEOG 101 or BIOL 100/102
3 hrs, 3 cr.

PGEOG 332 Introduction to Hydrology

GER 3/B

Examination of the storage and flux of water on and near the earth's surface; problems of water supply, quality and management. Credit may be earned for either PGEOG or GEOL 332 but not both.

prereq: GEOL 101, PGEOG 130 *or perm instr.*
3 hrs, 3 cr.

PGEOG 334 Coastal Geomorphology

See GEOL 334

PGEOG 335 Urban and Metropolitan Coasts

GER 3/B

A systematic study of the natural and anthropogenic processes on urban coastal environments. Special emphasis on the coastline of the NY metropolitan area, with examples from coastal cities worldwide.

3 hrs, 3 cr.

PGEOG 361 Global Climatic Change

GER 3/B

Jr/Sr only. Examination of Prequaternary, Quaternary, postglacial, historical and instrumentally recorded climates. Greenhouse gases, aerosols, radiative forcing, processes and modeling. Detecting the greenhouse effect, sea level rise and effects on ecosystems.

prereq: PGEOG 130 *or* GEOL 101 *or* 105
3 hrs, 3 cr.

PGEOG 363 Environmental Hazards

GER 3/B

Structure and impact of environmental hazards and the societal responses to them. Impact of hazards in urban settlements both in the developing world and developed world contexts.

prereq: PGEOG 130 *or equiv.*
3 hrs, 3 cr.

PGEOG 381, 382, 383 Special Topics in Environmental Studies

GER 3/B

Open to Jr/Sr only. Topics to be announced.

prereqs: GEOL 105, GEOG 226 *or* PGEOG 130, one course of which special topic is logical outgrowth; *perm instr.*
1-4 hrs (lec or lec/lab), 1-3 cr.

PGEOG 391, 392, 393 Individual Study in Environmental Studies

Individual studies and readings, with lab or fieldwork where appropriate, carried out under faculty guidance.

prereqs: GEOL 105, GEOG 226, PGEOG 130, *perm dept.*
1-3 cr.

PGEOG 490 Honors in Environmental Studies

Open to upper Jr/Sr environmental studies majors only. Individual research to be carried out under faculty guidance. Results may be embodied in an honors essay or equivalent.

prereq: perm dept.

PGEOG 498 Internship in Environmental Studies

Open to qualified environmental studies majors and minors, upper Jr/Sr only. Opportunities for working in positions of responsibility in professional institutions for academic credit. See environmental studies faculty adviser.

1-4 cr.

GEOGRAPHIC TECHNIQUES AND METHODS**GTECH 201 Introduction to Mapping and Geographic Information Sciences**

A survey of the basic principles of map design, map data analysis, cartography, geographic information science (GIS), remote sensing and air photo interpretation in the classroom, laboratory and field, including the use of computers for geoscience applications.

pre- or coreqs: GEOG 101, MATH 125 *and* 126, STAT 113 *or equiv or perm instr.*
6 hrs (2 lec, 4 lab), 4 cr.

GTECH 301 Quantitative Methods in Geography

Open to Jr/Sr only. Process of spatial analysis. Application of scientific methods to geographic research; sampling; distribution measurement; statistical analysis of spatial data.

prereqs: GTECH 201, STAT 113 *or* 213 *or perm instr.*
3 hrs, 3 cr.

GTECH 321 Remote Sensing

Remote sensing systems (multi-spectral, signature ID, digital image analysis), theory and applications.

prereqs: GTECH 201, Jr/Sr standing *or perm instr.*
6 hrs (2 lec, 4 lab), 4 cr.

GTECH 322 Advanced Image Interpretation

Project-oriented course in interpretation of air- and space-borne imagery.

prereq: GTECH 321
4 hrs (2 lec, 2 lab), 3 cr.

GTECH 350 Field Topographic Surveying

Field use of surveying equipment. Notebook and computer data collection relating to horizontal and vertical location on the landscape, including the use of global positioning systems. Field record-keeping and preliminary analysis of results. Fee for transportation, accommodations and food allowance required. Offered summer intersession (check with dept. in April).

prereqs: GTECH 201, *perm instr.*

90 hrs of field/lab work (1 day lab, 10 days field), 3 cr.

GTECH 351 Field Techniques in Geography

Observation and analysis of physical geography, biogeography and geomorphology of selected areas. Field geographic techniques such as ground-truthing of remotely sensed images, the use of maps, compasses and GPS to navigate. Fee for transportation, lodging and food allowance required. Offered summer intersession (check with dept. in April).

prereqs: GTECH 201, *any two additional geography or geology courses, perm dept.*

90 hrs field/lab work (3 days lab, 7 days field), 3 cr.

GTECH 361 Geographic Information Science I

The basic principles and operation of geographic information systems (GIS); computerized systems for the capture, storage, management, analysis and display of geographically referenced data and their attributes. Laboratory exercises will provide extensive hands-on experience with a professional GIS software package.

prereq: GTECH 201

4 hrs (2 lec, 2 lab), 3 cr.

GTECH 362 Geographic Information Science II

Theoretical and practical aspects of geographical information science (GIS) are discussed in detail. Laboratory use of advanced GIS software, including GIS programming concepts.

prereqs: GTECH 361, STAT 113

4 hrs (2 lec, 2 lab), 3 cr.

GTECH 380 Analytical and Computer Cartography

Role of computer in contemporary mapping; theoretical issues and practical mapping assignments, using cartographic software.

prereq: GTECH 201

4 hrs (2 lec, 2 lab), 3 cr.

GTECH 385 GIS Applications

Selected topics in GIS applications to human and physical geographic problems. See department for topics offered. May be repeated for credit as topics change.

prereq: GTECH 201 *or equiv.*

3 hrs, 3 cr.

GEOLOGY

GEOL 101 Fundamentals of Geology

GER 2/E

Plate tectonic theory; volcanism, earthquakes, continental drift, mountain-building. Mineral deposits, fossil fuels. Erosional processes, agents. Hazards. Lab: study of minerals, rocks, maps. Field trips may be required; transportation fee.

6 hrs (3 lec, 3 lab), 4.5 cr.

GEOL 102 Plate Tectonics and the Earth's Evolution

GER 2/E

Study of earth from solar system's inception to present. Evolution of its crust, atmosphere, hydrosphere. Record of life. Lab: study of fossils, sedimentary facies, cross-sections, maps. Field trips may be required; transportation fee.

prereq: GEOL 101

5 hrs (3 lec, 2 lab), 4 cr.

GEOL 105 Introduction to Environmental Geoscience

Introduction to environmental geoscience focusing on aspects of global change and the interrelationship of earth systems. Review of the evolution of the earth from its origins to potential future developments; environmental problems and issues.

prereq: ENGL 120

3 hrs, 3 cr.

GEOL 180 Introduction to Oceanography

GER 2/E

Properties of sea water, description of the state and biology of the oceans, ocean floor topography, basic ocean currents and general circulation, methods of exploration and research. No lab component.

3 hrs, 3 cr.

GEOL 205 Environmental Geology

GER 3/B

Geology's role in understanding and solving such problems as hazards, water supply, drainage, construction, waste disposal and health. Land use analysis and planning.

prereq: GEOL 101

3 hrs, 3 cr.

GEOL 231 Principles of Geomorphology

GER 2/E or 3/B

Study of landforms and their evolution. Emphasis is placed on topographic expression of geologic structures and features.

prereq: PGEOG 130 or GEOL 101

4 hrs (2 lec, 2 lab), 3 cr.

GEOL 280 Marine Geology

GER 3/B

Morphology of ocean floor. Genesis and distribution of marine sediments. Use of geophysical and oceanographic data.

prereq: GEOL 102 *or perm instr.*

3 hrs, 3 cr.

GEOL 332 Hydrology

See PGEOG 332

GEOL 334 Coastal Geomorphology

GER 3/B

A study of the basic processes shaping the coast and the resulting form; surficial morphology and internal geometry of such forms as cliffs, dunes, beaches and near shore bars. Map exercise and a one-day field trip.

prereq: GEOL 231 *or PGEOG 231 or equiv. or perm dept.*

3 hrs, 3 cr.

GEOL 380 Advanced Oceanography: Chemistry and Physics of the Oceans

GER 3/B

Examination of the physics and chemistry of oceans. Completion of GEOL 180 prior to enrollment is strongly recommended.

prereqs: one sem CHEM or PHYS, MATH 150 or equiv.

3 hrs., 3 cr.

GEOL 381, 382, 383 Special Topics in Geology and Oceanography

GER 3/B

Intensive courses in various aspects of geology or oceanography. Topics to be announced.

prereqs: 200-level course of which special topic is logical outgrowth, perm instr.

1-4 hrs (lec or lec/lab), 1-3 cr.

GEOL 391, 392, 393 Individual Study in Geology

Individual studies and readings, with lab or fieldwork where appropriate, carried out under faculty guidance.

prereqs: 2 sems of geology, perm dept.

1-3 cr.

Courses Not Offered During 2004-2007:

GEOG 210 Elementary Field Geography

GEOG 211 Field Geography of New York City and Vicinity

GEOG 242 Medical Geography

GEOG 272 Regional Geography of Europe

GEOG 348 Geography of Religion

GTECH 320 Interpretation of Aerial Photography

PGEOG 212 Geography of Soils and Vegetation

GEOL 211 Field Geology of New York City and Vicinity

GEOL 233 Geology of North America

GEOL 244 Sedimentology

GEOL 248 Principals of Stratigraphy

