

**The University of Maryland
Department of Geography**

GEOGRAPHY

**Undergraduate Major
Student Brochure**



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INTRODUCTION

What is Geography?

Geography is *people, places* and *environments*. And these are just the starting points! Geography means understanding *location* and *interpreting* how people live in particular places; the *relationships* between places; the complexities of *environments*; and the *human use* of environments. Among other activities, geography students make and study maps, interpret satellite images and aerial photographs, process satellite data to map landcover and coastal erosion, pursue fieldwork in widely differing locations, and convert other statistical data into their own maps and computer graphics.

The University of Maryland, College Park campus has over 150 undergraduate students majoring in Geography and more than 80 students doing graduate work in Geography. How do students become Geography majors? Most discover Geography by taking Geography 100 or 130 as part of their general education requirements; some are attracted by a specific course listed in the catalog or Schedule of Classes; and many come to Geography on the recommendation of a friend. Many Geography students transfer from other colleges and universities, or from other departments on campus, such as Engineering or Computer Science. Others take courses in Geography as part of other majors. Some colleges, particularly the community colleges, offer two-year specialties in geography, cartography, and planning.

Geography is a discipline whose content is broad. Unlike Biology with its emphasis on living organisms and Sociology with its emphasis on human interactions, Geography has no restrictive boundaries of subject matter; all aspects of the Earth's systems (human and physical) are within the scope of Geography. A geographer learns to deal with physical and social processes and problems in a variety of places under varying environmental conditions. Most geography courses are strongly concerned with locational approaches and viewpoints. At UMD all undergraduates have training in geographic techniques (i.e., computer cartography, remote sensing, Geographic Information Systems (GIS), field methods and quantitative techniques). As a result, UMD geography graduates have the tools and perspectives to deal with a wide range of physical and human problems.

As a discipline, Geography requires that students use and integrate information from the physical and natural sciences, the social and behavioral sciences, and the humanities. These areas are reflected by the courses offered at Maryland. Some advanced geography courses, such as geomorphology and climatology are physical science oriented; economic geography, urban systems, and population geography focus on the social sciences, while human dimensions of global change and cultural geography combine the two.

Jobs in Geography

The University of Maryland Department of Geography is a world leader in Earth Systems Science and disciplines concerned with understanding the physical, biological and human dimensions of the Earth's Systems. Designing environmental impact studies, developing land-use classification systems for the Chesapeake Bay watershed, global change research, developing a degradation early warning system for Africa, implementing spatial data bases on super

computers, designing a new NASA space probe: these are examples of current activities in the Department. Examples of some of the jobs that University of Maryland Geography students obtain after graduating include the following: Don Cannon is a transportation planner, Bob Benninghoff is a member of the Louisiana Planning Commission and Jim Jordan is a planner with the state of Maryland. Dorothy Hall monitors global snow cover at the Goddard Space Flight Center (NASA) and Mike Blank works at Earthsat Corporation. At the University of Wisconsin, Carol Jenner teaches climatology and physical geography while Henry Tom works for the U.S. Census Bureau as a Cartographer. Nelson Ormsky is Transportation Manager at BWI airport. Christina Canova is an Information Officer at the Defense Intelligence Agency. What do these people have in common? *All these people received Geography degrees from the University of Maryland.*

Geography students pursue all kinds of careers. Because of the interdisciplinary nature of the field, the kind of career you chose could take you in any direction. In 1995 the National Research Council has published a report showing that jobs in Geography have increased considerably over the past twenty years. The most common jobs held by geographers are *Cartographer, environmental manager/technician, GIS Specialist, teacher, and urban/regional planner.* But there are so many other paths for a Geographer to take.

Because of the close connections between NASA and the Department of Geography at the University of Maryland, many students go on to careers in Remote Sensing research. A key preparation for this research is the Geographic Information and Computer Cartography program, which emphasizes skills that are greatly in demand at NASA, USDA, NOAA, Maryland National Capital Park and Planning Commission, and other government and private agencies. Students in our department often begin internships at these companies and agencies as undergraduates, leading to careers as researchers and policy-makers.

Internships

An optional internship is available to juniors and seniors. Students who apply and are accepted work the equivalent of two full days a week at the internship, complete a substantial research paper and are awarded six credits (GEOG 386/387). This allows a student the opportunity to gain experience in an agency doing work most closely aligned to his/her interests, while also earning academic credit. Although most internships occur during the regular Fall or Spring semesters, the program is flexible to allow participation in summer or winter. Majors have interned with organizations such as the US Census Bureau, Federal Aviation Administration, Maryland-National Capital Parks and Planning Commission, Earthsat Corporation, National Geographic and the Population Reference Bureau.

Departmental Honors Program

Students admitted to the Honors program engage in independent research under the guidance of an individual faculty member. Students are eligible, upon completion of 30 credits of geography courses including the required courses. Honors students substitute six credits of honors research for six credits of formal coursework. The result of student research is an undergraduate thesis. The courses are:

GEOG 396	Honors Research	3 credits
GEOG 397	Honors Thesis	3 credits

Gamma Theta Upsilon

There is a chapter of Gamma Theta Upsilon, the national geography honorary fraternity, on campus. This group provides a social nucleus for geography majors holding regular meetings, inviting speakers, planning career days, field trips, parties and fund-raising activities. The fraternity has an office (1111B Lefrak Hall) as its base of operation. Members of GTU also work as peer advisors.

Computer Mapping and Spatial Analysis Laboratory

Analyzing geographical data is greatly assisted by the use of computers. Within the Department of Geography, you will find the Turner Instructional Computer Laboratory, Lefrak 1136 and 1138. It has a wide range of computing hardware and software, specially configured to assist the manipulation, analysis and display of geographic data. The Open Lab was recently outfitted with a brand new complement of Sun Ultra 10 and Ultra 10/Creator 3D Unix workstations. Some classes are taught in the laboratory, but it is primarily a staffed open lab.

Advising

The department maintains an advising office, located in room 2108 Lefrak. You can contact an advisor at 301-405-4073 or via e-mail at geog-advise@umail.umd.edu. Advising occurs on a walk-in basis, so there is no need to schedule an appointment, but hours vary by semester. The advisors help students choose courses to meet their curriculum requirements, and the Advising Office also sponsors a career and internship fair each semester. Geography faculty members provide mentoring and career advice. The undergraduate website (<http://www.geog.umd.edu/academic/undergrad/undergradprogram.html>) is also a resource for undergraduates.

Electives

Given the variety of subject matter found in the study of geography, it is easy to see why some students major in geography simply because they find it interesting. They find the problem-solving orientation useful in most jobs and they like the breadth of the subject matter. Because the major takes up only 35 credit hours of the 120 total for graduation, there is plenty of opportunity to take electives in a wide range of related fields within the university. The department encourages students to minor in a recognized program in the university or, working with their advisors, they may develop a program of supporting courses related to their specific interest areas, such as urban affairs, environmental programs, etc.

Geography Department Faculty

- Jochen Albrecht**, Ph.D., University of Vechta, Germany, 1995 -- theoretical issues in GIS, landscape ecology
- Harold Brodsky**, Ph.D., Washington, 1966 -- economic, quantitative, transportation
- Charles M. Christian**, Ph.D., Illinois, 1975 -- urban, urban social, social policy, minorities, demography
- Joseph Cirrincione**, Ph.D., Ohio State, 1970, (joint appointment with EDCI) and Director of Undergraduate Studies -- geography in education
- Ruth DeFries**, Ph.D., Johns Hopkins, 1980. -- effects of land cover on global change.
- Catherine Dibble**, Ph.D., UC-Santa Barbara, 2001 -- agent based modeling
- Ralph Dubayah**, Ph.D., UC-Santa Barbara, 1991 -- climatology, remote sensing, spatial analysis
- Martha E. Geores**, Ph.D., North Carolina, 1993, -- population and environment interactions, Latin America, natural resource definition, landscape
- Samuel N. Goward**, Ph.D., Indiana State, 1979, -- remote sensing, numerical analysis, modeling, climatology
- Chris Justice**, Ph.D., University of Reading, 1977, -- remote sensing, land cover dynamics
- Eric Kasischke**, Ph.D., The University of Michigan, 1992, -- biogeography, applications of remote sensing
- Michael S. Kearney**, Ph.D., Western Ontario, 1981, -- coastal geomorphology, estuaries, Quaternary, paleontology
- Axel Kleidon**, Ph.D., University of Hamburg, 1998, -- biogeography
- Shunlin Liang**, Ph.D., Boston, 1993, -- digital cartography, remote sensing, radiative transfer modeling.
- Stephen Prince**, Ph.D., Lancaster, 1971, -- biogeography and remote sensing
- John Townshend**, Chair, Ph.D., London, 1971, -- land cover dynamics, remote sensing, fluvial geomorphology

Lecturers

- Allen Eney**, M.A., Maryland 1985. – “Maryland and Adjacent Areas,” “Cultural Geography,” “Introduction to Human Dimensions of Global Change”
- Eugene Kinerney**, Ph.D., Maryland – “Washington DC, Past and Present”, "American Cities," and "Geomorphology"
- Mila Zlatic**, Ph.D., Belgrade – political geography, population geography

These faculty members and lecturers carry out the large majority of our teaching. Additionally, visiting and adjunct faculty from universities abroad also enhances our course offerings and by adjunct faculty, who usually work in the greater Washington area. Recent instructors include:

- Frederick Broome**, U.S. Census Bureau
- Ronald E. Grim**, (Ph.D., Maryland) Cartographic Librarian, Library of Congress
- Tim Trainor**, U.S. Census Bureau
- Compton Tucker**, (Ph.D., Colorado State) NASA
- Charles Walthall** (Ph.D., Nebraska) Department of Agriculture

Summary

UMCP geography graduates have found professional positions in a wide variety of settings -- government agencies, planning firms and teaching positions at all levels. Additional electives of some of our other graduates include: measuring population changes by using satellite images; computer mapping; cataloging map collections; grant planning; attracting industry to the state of Maryland, university teaching and research; and transportation planning. These activities demonstrate that Geography is truly about *people, places* and *environments*.

The Geography Department is ready to advise students about all aspects of the Department -- courses, programs and careers. Call the Department's Advising Office at 405-4073 to make an appointment or just to chat with an advisor or faculty member.

Majoring in Geography

Geography offers two specializations: 1) Geography, and 2) Geographic Information Systems and Computer Cartography. Either specialization will earn you a Bachelor of Science in Geography, but the curriculum between the two differs significantly, as do the potential career options that each specialization offers.

The Geography Specialization

In order to specialize in *Geography*, a student must complete all University CORE requirements plus a minimum of 35 credits in geography and 15 credits of supporting courses. Of the 35 credits, there are 8 credits of Geography "Primary" requirements, 9 credits of "Gateway" courses, 15 credits of upper-level Geography elective courses, and 3 credits of a quantitative course. In addition, 15 credits of course work outside of the Department are required; the credits can be either in one department or in an area of concentration. Students specializing in Geography usually do not apply more than one technique course toward the major requirements.

With the Geography specialization, students may choose one of four areas of concentration: physical geography and environmental management, urban geography and regional development, human dimensions of global change, and human geography. These concentrations are described in detail below.

Primary Course Requirements (8 credits)

The "Primary Requirement" consists of four 200 level courses that introduce the major areas of geographic research and prepare students for upper level courses. These are normally taken before doing upper division work in the Department.

GEOG 201	Geography of Environmental Systems	3 credits
GEOG 211	Geography of Environmental Systems Laboratory	1 credit
GEOG 202	The World in Cultural Perspective	3 credits

Gateway Requirements (9 credits)

Students specializing in Geography must also select one human, one physical and one techniques course. In selecting these courses, a student may wish to determine courses that would be most applicable to their area of concentration.

Human Courses

GEOG 320 The United States and Canada
 GEOG 321 Maryland and Adjacent Areas
 GEOG 323 Latin America
 GEOG 326 Africa
 GEOG 350 The American City: Past and Present
 GEOG 362 (360) Cultural Geography

Physical Courses

GEOG 340 Geomorphology
 GEOG 345 Climatology
 GEOG 347 Introduction to Biogeography

Techniques Courses

*Geography majors usually may only apply one technique course to the curriculum
 GEOG 371 Computer Cartography
 GEOG 372 Remote Sensing
 GEOG 373 Geographic Information Systems

Upper-Level Courses: (15 credits) You may choose an area of concentration, or you may select any combination of courses. Geography majors usually are limited to one technical course for the Technical Gateway requirement.

PHYSICAL GEOGRAPHY

340 - Geomorphology
 345 - Climatology
 347 - Introduction to Biogeography
 440 - Advanced Geomorphology
 445 - Advanced Climatology
 447 - Biogeography
 448 - Field & Laboratory Techniques in Environmental Systems

ECONOMIC GEOGRAPHY/
LOCATIONAL ANALYSIS

430 - Location Theory & Spatial Analysis
 433 - Transportation Networks
 436 - Issues in Urban Transportation

HUMAN GEOGRAPHY

320 - The United States and Canada
 321 - Maryland and Adjacent Areas
 323 - Latin America
 326 - Africa
 361 - Introduction to Human Dimensions to Global Change
 362 (360) - Cultural Geography
 421 - Cultural Ecology
 422 - Population Geography
 423 - Political Geography

TECHNICAL COURSES

371 – Computer Cartography
372 – Remote Sensing
373 – Geographic Information Systems
471 – Advanced Computer Cartography
472 – Advanced Remote Sensing
473 – Advanced GIS

URBAN GEOGRAPHY

350 - The American City Past and Present
450 - The Contemporary City
454 - Washington: Past & Present
456 - Social Geography of Metropolitan Areas in Global Perspective

OTHER

GEOG 384 Internship in Geography
GEOG 385 Internship Research Paper
GEOG 396 Honors Research
GEOG 397 Honors Thesis

Areas of Concentration

Majors in Geography are required to select 15 credits of upper level systematic geography courses, which make up the area of concentration. Students are encouraged to use the resources of various career centers and the department advisors to develop a program providing the type of training and skill development in line with their interest and career goals. The selection of supporting courses provides additional opportunity for students to enhance their training in an Area of Specialization. The following areas are indicative of the major grouping of courses offered by the Geography Department and are examples of possible areas of specialization.

In addition to these areas of specialization, all Geography majors are reminded of the importance of techniques to all geographic study. Students with at least a working knowledge of remote sensing, quantitative methods, computer applications, cartography, and field methods will find that they have important, marketable skills when seeking jobs.

1) *Urban Geography and Regional Development* provides preparation for those students considering careers in planning and teaching. Among the departmental offerings are:

Major courses:

GEOG 350 The American City Past and Present
GEOG 450 The Contemporary City
GEOG 454 Washington: Past and Present
GEOG 456 The Social Geography of Metropolitan Areas in Global Perspective

Additional Dimension:

GEOG 422 Population Geography
GEOG 423 Political Geography
GEOG 430 Location Theory and Spatial Analysis
GEOG 433 Transportation Networks
GEOG 436 Issues in Urban Transportation
GEOG 473 Geographic Information Systems and Spatial Analysis

Students often take supporting coursework through the Institute for Urban Studies, the Departments of Government and Politics, Sociology, Economics, Family & Community Development, Housing and Applied Design, Civil Engineering, and School of Architecture, and Computer Science.

2) *Physical Geography and Environmental Management* attracts students who are interested in the natural environments, the interaction between man and the environment, and in monitoring aspects of global change. This specialty also prepares students to deal with environmental problems in planning and regulatory agencies. The offering include:

Major Courses:

- GEOG 340 Geomorphology
- GEOG 345 Climatology
- GEOG 347 Introduction to Biogeography
- GEOG 440 Advanced Geomorphology
- GEOG 442 Applied Climatology
- GEOG 448 Field & Laboratory Techniques in Environmental Science
- GEOG 462 Water Resources and Water Resource Planning
- GEOG 463 Geographic Aspects of Pollution
- GEOG 447 Biogeography

Additional Dimensions:

- GEOG 421 Cultural Ecology
- GEOG 422 Population Geography
- GEOG 471 Advanced Computer Cartography
- GEOG 472 Advanced Remote Sensing
- GEOG 473 Geographic Information Systems and Spatial Analysis

Supporting coursework can be taken in Geology, Natural Resources Sciences and Landscape Architecture, Biological Resources Engineering, Agricultural Resources Economics, Meteorology, biological sciences, and physical sciences.

3) *Human Geography* is of interest to students concerned with the geographic aspects of population, politics, history, and other social and cultural phenomena. The course offerings in this area include:

Major courses:

- GEOG 320 The United States and Canada
- GEOG 321 Maryland and Adjacent Areas
- GEOG 323 Latin America
- GEOG 326 Africa
- GEOG 362 (360) Cultural Geography
- GEOG 421 Cultural Ecology
- GEOG 422 Population Geography
- GEOG 423 Political Geography

Additional Dimensions:

- GEOG 350 The American City: Past and Present
- GEOG 454 Washington: Past and Present
- GEOG 473 Geographic Information Systems and Spatial Analysis

Supporting coursework can be taken in Afro-American Studies, Anthropology, Sociology, History, Government and Politics, American Studies, and Agricultural Resources Economics.

4) *Human dimensions of global change* is for those students interested in the demographic, social, cultural, economic, and historical aspects of human systems with particular emphasis on human dimensions of global change and integration with physical systems.

Major courses:

- GEOG 340 Geomorphology
- GEOG 345 Climatology
- GEOG 347 Introduction to Biogeography
- GEOG 372 Remote Sensing
- GEOG 421 Cultural Ecology
- GEOG 422 Population Geography
- GEOG 423 Political Geography
- GEOG 430 Location Theory and Spatial Analysis
- GEOG 472 Advanced Remote Sensing
- GEOG 447 Biogeography

Additional dimensions:

- GEOG 373 Geographic Information Systems
- GEOG 440 Advanced Geomorphology
- GEOG 450 The Contemporary City
- GEOG 473 Geographic Information Systems and Spatial Analysis

Supporting coursework can be taken in Afro-American Studies, Anthropology, Sociology, History, Government and Politics, American Studies, and Agricultural Resources Economics.

The Geographic Information Science and Computer Cartography Specialization

The specialization in Geographic Information Science and Computer Cartography is designed to give students the technical skills needed to acquire, manage, and analyze geographic data. Students will receive extensive computer training in digital processing of remote sensing observations and cartographic vector data, spatial analysis, and the display of information products. This program requires 35 credits. Of these, 8 credits of primary courses are required, 6 credits of gateway courses, and 6 credits of upper level non-technical geography electives. The remaining 15 credits are to be selected from upper level technique courses. In addition, 15 credits of course work outside of the Department is required. Courses are to be selected from the list of "Courses for Supporting Areas and Electives for GIS" and selected from just two of the areas listed.

Primary Requirements (8 credits)

The "Primary Requirements" consist of four 200 level courses that introduce the major areas of geographic research and prepare students for upper level courses. These are normally taken before doing upper division work in the Department.

GEOG 201	Geography of Environmental Systems	3 credits
GEOG 211	Geography of Environmental Systems Laboratory	1 credit
GEOG 202	The World in Cultural Perspective	3 credits
GEOG 212	The World in Cultural Perspective Laboratory	1 credit

Gateway Requirements (6 credits)

Cartography majors must also select one human, and one physical course.

Human Courses

- GEOG 320 The United States and Canada
- GEOG 321 Maryland and Adjacent Areas
- GEOG 323 Latin America
- GEOG 326 Africa
- GEOG 350 The American City: Past and Present
- GEOG 362 (360) Cultural Geography

Physical Courses

- GEOG 340 Geomorphology
- GEOG 345 Climatology
- GEOG 347 Introduction to Biogeography

Upper-Level Courses (6 credits)

You may choose to specialize within one subfield, or you may select a combination of courses.

PHYSICAL GEOGRAPHY

- 340 - Geomorphology
- 345 - Climatology
- 347 - Introduction to Biogeography
- 440 - Advanced Geomorphology
- 445 - Advanced Climatology
- 447 - Biogeography
- 448 - Field & Laboratory Techniques in Environmental Systems

HUMAN GEOGRAPHY

- 320 - The United States and Canada
- 321 - Maryland and Adjacent Areas
- 323 - Latin America
- 326 - Africa
- 361 - Introduction to Human Dimensions to Global Change
- 362 (360) - Cultural Geography
- 421 - Cultural Ecology
- 422 - Population Geography
- 423 - Political Geography

ECONOMIC GEOGRAPHY/
LOCATIONAL ANALYSIS

430 - Location Theory & Spatial Analysis
433 – Transportation Networks
436 - Issues in Urban Transportation

OTHER

GEOG 384 Internship in Geography
GEOG 385 Internship Research Paper
GEOG 396 Honors Research
GEOG 397 Honors Thesis

URBAN GEOGRAPHY

350 - The American City Past and Present
450 - The Contemporary City
454 - Washington: Past & Present
456 - Social Geography of Metropolitan
Areas in Global Perspective

Upper Level Technique Courses (15 credits)

Students should choose 5 upper level courses from the following list:

GEOG 371 - Computer Cartography
GEOG 372 - Remote Sensing
GEOG 373 - Geographic Information Systems
GEOG 471 - Advanced Computer Cartography
GEOG 472 - Advanced Remote Sensing
GEOG 473 - Geographic Information Systems and Spatial Analysis

Supporting Area Courses

Students majoring in Geographic Information and Computer Cartography must take 15 credits in a supporting area. Students are encouraged to take these courses primarily from the Mathematics (MATH) and Computer Science (CHSC) departments. The Department requires that at least one of these courses should be a quantitative course. If the student is interested in remote sensing, they may incorporate courses from the Physics (PHYS), Biology (BIOL), or Meteorology (METO) departments. Students interested in the GIS or Cartographic aspects incorporate courses in Psychology (PSYC). A listing of approved courses will be updated regularly and can be found in the advising office. The advising office prior to registration must approve all supporting area courses.

Interested in Both Specializations?

If you are interested in pursuing both the Geography and the GIS and Computer Cartography specializations, you can complete both sets of curriculums. If your primary specialization is Geography, you will be awarded a Bachelor of Science in Geography with a specialization in Geography. You will also be awarded the GIS Citation, a thirteen-credit citation program (see below for more information on the citation program). Finally, you will receive a departmental certificate enumerating the additional coursework you completed by following both curriculums. If your primary specialization is GIS and Computer Cartography, you will be awarded a Bachelor of Science in Geography with a specialization in GIS and Computer Cartography. You can also earn a departmental certificate that enumerates the additional coursework in Geography.

Geography and Social Studies Education

A special double major exists for students in the College of Education that allows them to specialize in Geography. Students are required to take the following Geography courses:

GEOG 201 – Geography of Environmental Systems (3 credits)
GEOG 211 – Physical Geography Lab (1 credit)
GEOG 202 – The World in a Cultural Perspective (3 credits)
GEOG 212 – Human Geography Lab (1 credit)

1 – 300 level physical geography course (3 credits)
1 – 300 level human geography course (3 credits)
1 – 300 level technique geography course (3 credits)

4 – upper level systematic geography electives (12 credits)

Pre-Professional Requirements - The following courses are also required. They will also be used for your supporting course requirements.

Speech (3 credits)
SOCY or ANTH (3 credits)
ECON 200 (4 credits)
ECON 310, 311, or 315 (3 credits)
GVPT 100, 260, or 280 (3 credits)
GVPT 170 (3 credits)
HIST 156 or 157 (3 credits)
HIST at 100 or 200 level (non-US History/Non-western history) (3 credits)
HIST/social science elective (3 credits)
Ethnic or minority study (can be either a social science or history course- consult CORE diversity listing) (3 credits)

The Citation Program in Geographic Information Science

This citation is designed to give students the technical skills needed to acquire, manage and analyze geographic data. Almost everything we do involves geographic information: deciding where to live and travel, environmental monitoring, and urban planning. Influenced by computer technology, the academic disciplines of geographic information science such as remote sensing, geographic information systems (GIS) and computer cartography have evolved dramatically in the past few decades. The fields of remote sensing, the science of obtaining geographic information from aircraft and satellites, and GIS, a computer technology that manages and analyzes different forms of digital geographic data, have been growing at an extraordinary rate. Computer cartography has revolutionized traditional cartography to vastly improve map making and visualization of geographic information in a multimedia environment. Students in the citation program will receive extensive training in digital processing of remote sensing

observations and cartographic vector data, spatial analysis, and the display of information products. **These skills are in great demand locally, nationally, and globally.**

The citation program is a 13-credit curriculum consisting of the following courses:

- GEOG 201 (3) Geography of Environmental Systems
- GEOG 211 (1) Geography of Environmental Systems Lab
- GEOG 371 (3) Computer Cartography
- GEOG 372 (3) Remote Sensing
- GEOG 373 (3) Geographic Information Systems

There are no special requirements for the GIS Citation Program, but interested students must apply in person at the Geography Advising Office in 2108 Lefrak Hall. The Advising Office will monitor the course requirements for the citation. At the completion of the Citation Program, the Registrar will be notified and a notation will be placed on the student's official transcripts.

All courses for the Citation must be taken at the Department of Geography at the University of Maryland, College Park. No course with an earned grade below a "C" may count towards the Citation. No more than six credits are to be counted toward the Citation and the student's major, supporting area courses, and college requirements.

GEOG Curriculum worksheet: Requirements for Specialization in Geography¹

Phone: 301-405-4073; geog-advise@umail.umd.edu

Geography Primary Courses - 8 credits

Course Number	CORE	Credits	Semester Completed	Grade
201	PL ²	3		
211	PL ²	1		
202	SB	3		
212		1		

Geography Gateway – 9 credits – 3 credits in each a Human, Physical and a Techniques course

Type	Course Number (circle one)	Credits	Semester Completed	Grade
Human	320, 321, 323, 326, 350, 362 (360), other ³	3		
Physical	340, 345, 347, other ³	3		
Technique	371, 372, 373, other ³	3		

Upper Level Geography Electives – 15 credits; you may choose to specialize within one subfield, or you may select a combination of courses.⁴

Course Number	Credits	Semester Completed	Grade
	3		
	3		
	3		
	3		
	3		

Quantitative Course – 3 credits

Course Number (circle one)	Credits	Semester Completed	Grade
GEOG 305, GVPT 422, PSYC 200, EDMS 451, MATH 111, STAT 100, SOCY 201, ECON 422, BMGT 230, Other ³	3		

Supporting Courses – 15 credits – Courses must be approved by a GEOG advisor.

Course Number	Credits	Semester Completed	Grade
	3		
	3		
	3		
	3		
	3		

Advanced studies:

- 1.
- 2.

¹ All courses must be completed with a grade of “C” or better

² GEOG 201 and 211 must be taken simultaneously to count for PL CORE

³ A Geography advisor must approve these courses

⁴ Technical courses are usually not be applied to these requirements

GEOG Curriculum worksheet: Requirements for Specialization in GIS & Computer Cartography¹

Phone: 301-405-4073; geog-advise@umail.umd.edu

Geography Primary Courses - 8 credits

Course Number	CORE	Credits	Semester Completed	Grade
201	PL ²	3		
211	PL ²	1		
202	SB	3		
212		1		

Geography Gateway – 6 credits – 3 credits in each a Human, and a Physical course

Type	Course Number (circle one)	Credits	Semester Completed	Grade
Human	320, 321, 323, 326, 350, 362 (360), other ³	3		
Physical	340, 345, 347, other _____ ³	3		

Upper Level Geography Electives – 6 credits.

Course Number	Credits	Semester Completed	Grade
	3		
	3		

Upper level Cartography, GIS, and Remote Sensing Electives – 15 credits

Course Number	Credits	Semester Completed	Grade
	3		
	3		
	3		
	3		
	3		

Supporting Courses – 15 credits – Students are encouraged to take these courses primarily from the Mathematics (MATH) and Computer Science (CHSC) departments. The Department strongly recommends that at least one of these courses should be a quantitative course. If the student is interested in remote sensing, they may incorporate courses from the Physics (PHYS), Biology (BIOL), or Meteorology (METO) departments. A listing of approved courses will be updated regularly and can be found in the advising office. **The advising office must approve all supporting area courses prior to registration.**

Course Number	Credits	Semester Completed	Grade
	3		
	3		
	3		
	3		
	3		

Advanced studies:

- 1.
- 2.

¹ All courses must be completed with a grade of 'C' or better.

² GEOG 201 and 211 must be taken simultaneously to count for PL CORE.

³ A Geography advisor must approve these courses.