

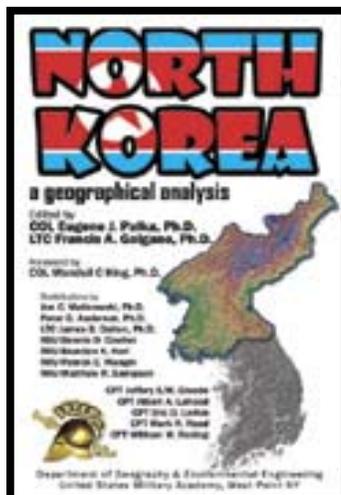
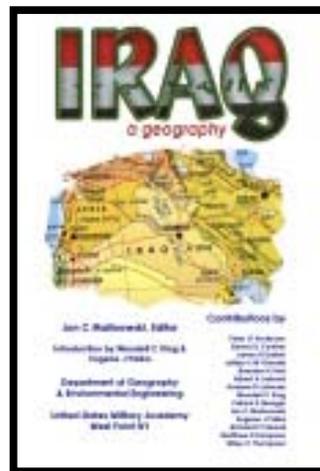
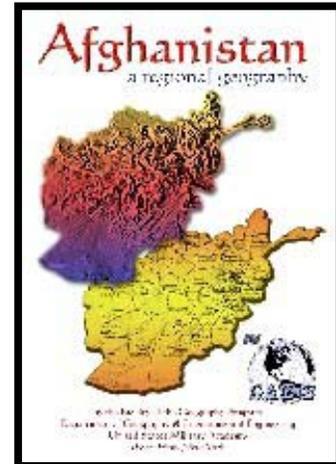
FACULTY CATALOG AND GUIDE TO ACADEMIC PROGRAMS



For the class of 2006

**UNITED STATES
MILITARY ACADEMY**
WEST POINT, NEW YORK

Department of Geography and Environmental Engineering



Serving
Cadets,
USMA,
and our
Nation

The mission of the Department of Geography and Environmental Engineering is to enhance the military and intellectual development of all cadets by providing an understanding of the earth, its people, and how they interact. Further, we offer studies in geography and the environmental sciences with the goal of preparing cadets for service in the Army and lifelong contributions to our Nation.

The overarching theme for this department is, “Better understanding of the world in which you live.” We offer a diverse group of majors and fields of study, which prepare you for service in the Army and offer a lifetime of intellectual growth. These include:

1. Human/Regional Geography – the study of people, places and how they interact.
2. Environmental Geography – the study of the interactions between people and the physical landscape.
3. Environmental Science – study of the processes, the causes, and the extent of environmental concerns.
4. Environmental Engineering – design of engineered solutions to human-induced environmental problems
5. Geospatial Information Science – integration & analysis of satellite, GPS, and map intelligence information.

Our majors and fields of study will prepare you for lifelong professions that are personally rewarding and important to our Nation.

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MESSAGE TO CADETS

In this ever changing Army and world there are several constants that remain guideposts, including:

- Understanding terrain will always be a key to victory in battle,
- Understanding other people is necessary to preserve peace, and
- Understanding our earth is critical for our future peace and security.

In a nutshell these describe what we in the Department of Geography and Environmental Engineering offer to you, first in our core course in physical geography and continuing with the exciting majors we teach. Our job is the same as every academic program at West Point, to prepare cadets for a career in the Army and a lifetime of service to the Nation. Each offering has the objective of developing you as a self-learner, problem solver and critical thinker, all attributes critical for every successful leader in the Army. In selecting a major or a field of study, you choose a subject to investigate in depth. Both the knowledge gained and the learning skills developed in this process better prepare you to contribute to the Army and the Nation over a lifetime. Your task in selecting a major is to find that subject which excites you and inspires a vision for the future. We have much to offer—Let me tell you more!

Geography may be the most under-appreciated discipline in education today. It is an exciting discipline with great variety and tremendous relevance for the military officer. Geography at West Point teaches cadets about the earth, its people, and how they interact. We offer studies focused on the peoples of the earth. Our **Human/Regional Geography** program examines the spatial differentiation and organization of human activity and how people adapt to their environment. Our **Environmental Geography** program develops the student's understanding of the processes - natural and human - that form and change the earth and how people interact with the physical environment. We use the Army as our laboratory to demonstrate how geography is used to accomplish military missions in peacetime and war. Geography majors have opportunities for advanced studies that literally take cadets around the world.

Studies in our **Environmental Science and Environmental Engineering programs** examine how humans sustain or degrade the earth through an understanding of human requirements and natural processes. The **Environmental Science program** expands on the interaction between humans and natural ecosystems, while the **Environmental Engineering program** investigates environmental concerns. The **Environmental Engineering program** is ABET accredited and completes the first step towards pursuing a professional engineering license. Effectively dealing with environmental considerations is key to success by Army leaders in the field today.

In our **Geospatial Information Science** program you learn to analyze, describe and visualize the features of the earth in very accurate detail. The newest and best computer hardware and software are used to instruct you in remote sensing, surveying, computer cartography, and geographic information systems, just to highlight a few. Army applications for this technology in knowing the battlefield are obvious, but there is so much more ongoing in this field. If you have interest in this area, come talk to the instructors and let them tell you all this area of study has to offer.

Regardless of the major you select, the **Environmental Engineering Sequence** will enhance the value of your West Point experience. This sequence accomplishes two primary goals in preparing you as an educated leader in the 21st century. First, it enhances your

ability to solve complex problems by introducing you to a process for rational decision-making as applied to current environmental issues. Second, the sequence provides an understanding of the main environmental issues threatening the well being of the world today including: safe and sufficient water for a growing world population, clean air and global atmospheric protection, and management and safe disposal of domestic, hazardous, and toxic wastes. Your understanding will be built on the science underlying these issues as well as the laws and regulations established to protect people and the environment. The sequence culminates by providing cadets the opportunity to solve a complex environmental problem with competing technical, socio-cultural, political, and economic requirements.

Your opportunities are exciting and the options are great. Please look through this pamphlet, find what interests you, and then come visit with our faculty who are anxious to assist you in understanding the rewarding opportunities available.

WENDELL C. KING
Colonel, U.S. Army
Professor and Head
Department of Geography
and Environmental Engineering



Department Web Site External to USMA:
<http://www.dean.usma.edu/geo/gene.htm>

Department Web Site Internal to USMA:
<http://www-internal.dean.usma.edu/departments/geo/gene.htm>



USMA cadets train on a T72 tank with Uzbek cadets at the Chirchik Tank Academy during the Uzbekistan Academic Individual Advanced Development (AIAD) trip



Cadets and sponsors in the Bahamas on Federal Emergency Management Agency AIAD

GEOGRAPHY AND ENVIRONMENTAL ENGINEERING AFTER GRADUATION

Each major in this department is focused on preparing you for success as a leader in the Army and a lifetime of service to the Nation. Successful leaders think critically about issues and are problem solvers. Whether majoring in geography or the environmental programs, the analytical problem solving approaches you experience in your classes will prepare you for today's Army. Many of the problems you will see in the Army will be studied in the classroom because in the Department of Geography and Environmental Engineering, the Army is our laboratory of real world examples. You will become capable users of the most modern technology in your field. This department has some of the best undergraduate laboratory facilities in the country, and our Geospatial Sciences Laboratory is world-class. The bottom line is you will understand the world around you, and be prepared to solve its and the Army's most complex problems. Our AIAD programs will afford you an opportunity to see how the Army uses your discipline by assignments to Army and DOD activities throughout the world.

Majoring in this department doesn't limit your branch opportunities, but expands your value in whatever branch you choose. Every branch needs leaders that understand the world, its people and how they interact. Every branch must train and operate within environmental regulations and in a way that sustains the limited training lands available. The special skills of the geospatial sciences are critical in every movement and deployment the Army makes.

What Geographers and Environmental Engineers Do for the Army

As a geographer or environmental engineer, you will be an asset for any branch or functional area throughout your career. Your keen understanding of the environment and man's interaction with it will provide you valuable insights for any mission. As our Nation and the Army continue to place more emphasis on cultural awareness and environmental issues, you will be well positioned to succeed regardless of your branch. Here are just a few examples of where your degree fits in the Army today.

Warfighting: Geographers and environmental engineers are found in all combat and support branches. Terrain and weather are critical elements of the tactical environment considered in every military mission. A working knowledge of physical geography enables the officer to judge the impacts of climate, soils, vegetation, and landforms on military operations. A clear understanding of the fundamentals of cultural geography is a critical element in operational planning, given high probabilities of low and mid-intensity conflict on foreign soil. Officers trained in the geospatial information sciences give our Army the edge in maintaining information dominance of the battlefield. Environmental engineers and scientists are well suited to understanding and addressing environmental issues associated with warfare ranging from the use of environmental devastation by our adversaries to the protecting of our troops from disease and the environmental hazards manifested by the destruction of war.

Operations Other Than War: As the Army's mission increasingly becomes one of peacekeeping and humanitarian support, the need for geographers and environmental engineers increases. Today's peacekeeping efforts occur around the world from Bosnia to East Timor. Likewise, humanitarian and disaster relief assistance have recently been provided in places like Haiti and Zaire. These examples reflect the diverse array of cultures and environments that our soldiers contend with daily. Officers trained in human geography

understand cultural, political, and economic situations and are a valuable asset to every peacekeeping mission. Environmental geographers assess the physical landscape, environmental resources, and human-environment interaction providing useful information for peacekeeping or disaster relief. The environmental scientist or engineer is well suited to meet the demands of these situations by providing safe drinking water, improving sanitary conditions, and mitigating adverse impacts of military operations. All rely on geospatial information such as remotely sensed imagery and geographic information systems as critical tools to aid the peacekeeping or relief efforts.

Supporting Military Training: During peacetime operations, leaders are increasingly challenged to develop imaginative ways of providing tough, realistic training for today's fighting force while sustaining and improving the environmental conditions of our training bases. In preparing for the unit's wartime mission, the geographer's understanding of contingency locations around the world is useful in developing any type of realistic training plan from replicating the terrain to developing probable scenarios. Environmental scientists and engineers implement policies and projects that support a broad range of environmental protection regulations from resource management to hazardous waste disposal. Using modern geospatial information sciences and techniques, the spatial distribution of key training area resources as well as potential hazards can be accurately recorded and analyzed.



Cadets interacting at the Chirchik Tank Academy during the Republic of Uzbekistan AIAD

GEOGRAPHY AND ENVIRONMENTAL ENGINEERING AT WEST POINT

General

The Department of Geography and Environmental Engineering at the United States Military Academy offers one of the best undergraduate facilities in the country for the study of geography, geospatial information science, and environmental science/engineering. Each cadet's elective sequence, in one of several distinct stems, is tailored according to personal interests and abilities. Throughout the program of study, special attention is focused on the analysis and evaluation of significant human-environment problems. This awareness of our stewardship of the "Spaceship Earth" permeates all aspects of the academic program, many of which are outside the traditional classroom setting.

Opportunities for Geography and Environmental Engineering Concentrators:

Department Activities and Facilities. Departmental concentrators are integrated into a variety of activities. Cadets are invited to attend lectures, seminars, and professional discussions on a wide array of subjects. Departmental facilities include a specialized library, map room, computer graphics center, a geology laboratory, cartography and remote sensing laboratory, and environmental laboratories. Picnics, luncheons, coffee calls and colloquia are held frequently so that students and faculty can continue the interactive process of learning in a variety of forums.

Academic Individual Advanced Development. The department sponsors an outstanding summer intern program for approximately 60 upper-class cadets as a part of Cadet Summer Training. All cadets have the opportunity to work with agencies such as the Army Environmental Center, the Army Environmental Policy Institute, the Topographic Engineer Center, the National Imagery and Mapping Agency, the Army Research Institute, the Environmental Protection Agency, and the Defense Intelligence Agency. Cadet travel can cover the entire world, including Central Asia, Southeast Asia, the Middle East, Southwest United States or any of an ever-changing array of locations. These programs offer unique opportunities for cadets to broaden their education while observing the critical contributions of their discipline at high levels of government.

Summer Credit. The department sponsors a geology field course in Colorado that extends the academic experience into the great outdoors. Many cadets find this not only an interesting program, but an alternative that balances course loads or frees time for athletics.

Academic Awards. The Congressional Medal of Honor Society Award is presented annually to a member of the graduating class for excellence in geography. The Order of the Founders and Patriots of America Award is presented annually to a member of the graduating class for excellence in environmental science or engineering. The National Organization of the Ladies Auxiliary Veterans of Foreign Wars of the United States Award is presented annually to a member of the graduating class for excellence in the environmental Engineering sequence. The Environmental Systems Research Institute Award is presented annually to a member of the graduating class for excellence in geospatial information science. These honors are given at the annual Graduation Awards Convocation to the major/concentrator in each respective field of study with the highest QPA in the elective program.

Individual Research. Each semester a number of cadets are selected to participate for academic credit in individually designed research and study programs on topics of special interest. Projects typically are designed jointly by cadets and their faculty supervisors and provide a unique opportunity to excel in an area of their choice. Examples of recent projects include a base camp suitability model for Croatia using GIS, a study of lead contamination in the Popolopen watershed, Iona Marsh study, storm water filter effectiveness study at the West Point Exchange, the design of a nature trail for use by the West Point Elementary School, and an evaluation of beach erosion hot-spots along the mid-Atlantic coast.

Academic Awards - Previous Awardees

Congressional Medal of Honor Society Award for Excellence in Geography

03 – Thomas Lainis	97 - Aaron Ecklund
02 - Eric Wilkinson	96 - Brian Gavula
01 - Matthew Sullivan	95 - Mark Walters
00 - Joshua Schneider	94 - Kevin Kercher
99 - Matthew Debiec	93 - Michael Senn
98 - Michael Lipsner	92 - Guillermo DeLos Santos, Jr.

Order of Founders and Patriots of America Award for Excellence in Environmental Science and Environmental Engineering

03 – Sarah Williams	97 - Ralph Radka
02 - Stephen Lewandowski	96 - David Hernke
01 - Paul McBride	95 - David Phillips
00 - Jeffery Jager	94 - Brett Sylvia
99 - Travis Rayfield	93 - William Chess
98 - Bradley Stoltz	92 - Melanie Lauben

National Organization of the Ladies Auxiliary Veterans of Foreign Wars of the United States Award for Excellence in the Environmental Engineering Sequence

03 - Daniel Tran	97 - Jacob Kramer
02 - Jose Garcia-Aranda	96 - Brian Gavula
01 - Jeffrey Han	95 - Jason Rowe
00 - Nicholas Schommer	94 - Kevin Hicks
99 - Stephen Mintz	93 - John Brown
98 - William Blake	

Environmental Systems Research Institute award for excellence in Geospatial Information Science

03 – Jeffrey Oster
02 - Miguel Gastellum
01 - Ryan Piotrowski
00 - Joshua Schneider

GEOGRAPHY & ENVIRONMENTAL ENGINEERING PROGRAMS

Class of 2006

SCOPE: Our Geography, Environmental Science and Engineering, and Geospatial Information Science programs are designed to prepare cadets for careers involving observation, measurement, evaluation and design of human and physical systems in today's increasingly interdependent world. State of the art departmental laboratory facilities for geology, environmental science and engineering, cartography, photogrammetry, remote sensing, and geographic information systems support all program areas.

OPTIONS: Students desiring to complete a baseline program have five alternatives for a field of study (FOS). Those who choose academic enrichment in the discipline may take additional courses, or may choose to complete an optional major in any of those same five areas. The program areas are:

Human/Regional Geography
Environmental Geography
Environmental Science
Environmental Engineering
Geospatial Information Science

CORE REQUIREMENTS: You must complete or have received USMA credit for the 26 common, core courses as shown in the General Section of the USMA Academic Program (REDBOOK) for your class. You must also fulfill the new Information Technology core course requirement.

ENGINEERING SEQUENCE: The **3-Course Environmental Engineering Sequence** is available to all cadets. It offers an engineering sequence that highlights global issues and develops sustainable solutions to problems involving human activity and the environment. It provides the opportunity to learn and apply engineering design process in the physical world where social, political, and economic considerations are major factors in decision-making. The three objectives for this sequence include:

- (1) a knowledge of the most significant global environmental issues and the underlying causes and impacts on the natural environment and humankind.
- (2) an ability to develop and communicate engineered solutions to environmental problems, and
- (3) apply engineered solutions within a decision making process that includes economic, social, and political criteria.

The first course in the sequence, **EV300 (Environmental Science)**, provides cadets with a broad understanding of what the term "environment" encompasses and how influences, especially man-made, cause changes in the balance of the earth's natural and biological cycles. The second course, **EV350 (Environmental Technologies)**, builds on the EV300 experience through the application of science-based solutions (e.g., engineering) to deal with common environmental challenges. Finally, **EV450 (Environmental Decision Making)**, involves balancing engineered solutions with economic, socio-cultural, political, and ecological considerations within a decision-making process. Using many facets of water resources as a teaching model, cadets learn the realities of decision-making and policy development (hydropower, navigation, drinking water supply, fish habitat, recreation, etc.).

PROGRAM DESCRIPTIONS

GEOGRAPHY:

Geographers are concerned with the spatial arrangements, processes, connections, distributions, and organization of the physical and human worlds. Geography is a broad, integrating discipline with methodologies and analytical foundations that extend to many disciplines in engineering, science, and the humanities. The study of geography requires persistent curiosity and inquiry of the human-land-environment interfaces: how the earth-ocean-atmosphere system functions; how the physical landscape evolves; how human populations adapt to the land and climate; and how they, in turn affect the environment. Two choices of programs allow cadets to explore geography from either a natural science perspective or from a social science perspective. In the Environmental Geography program, cadets apply geographic approaches and skills to the study of the physical landscape, anthropogenic influences on the environment, and natural hazards. The Human/Regional Geography program enables cadets to explore cultural diversity, population trends, and political systems from a world and regional perspective. Both programs integrate the use of geographic skills enhanced through technologies such as computer mapping, remote sensing, and geographic information systems. Geography is the ideal discipline for the Army officer who must lead soldiers in a dynamic and changing world. The knowledge and understanding of terrain, weather, climate, and cultures coupled with a sense of environmental stewardship will provide cadets with a foundation for enlightened leadership and public service in conflict and peacetime.



Main Points of Contact:

Human/Regional Geography: Dr. Jon Malinowski, WH5352, ext 4673, email: bj0264

Environmental Geography: Dr. Peter Anderson, WH5311, ext 3509, email: bp5223

ENVIRONMENTAL SCIENCE:

The relationship between modern society and our Earth's environment is controlled by both a nearly insatiable desire for natural resources and the basic laws of science. The study of environmental science will prepare you to understand how the Earth responds to the pressures created by technological development and population growth. This program develops an understanding of the physical sciences that govern the Earth's environment by expanding the USMA core science education in chemistry and physics and adding studies in biology, geology, and meteorology. This broad academic background is excellent preparation for the challenges of a military leader who must balance resources and human requirements both within the United States and deployed overseas. Important outcomes of this program are an understanding of ecosystem response to human interaction and the impacts on humans by environmental degradation. Understanding both outcomes is critical in developing responsible environmental stewardship.



Main Point of Contact: Dr. Marie Johnson, WH5416, ext 4855, email: bm6894

ENVIRONMENTAL ENGINEERING:

Environmental engineers design systems that protect human health, clean up contamination from the past, and sustain the natural earth processes. Consequently, environmental engineers study the natural processes that control planet Earth, the impact of human activities on the natural world, and how to design, hence, engineer solutions to environmental problems. The USMA Environmental Engineering program looks closely at physical, chemical, and biological processes as they pertain to environmental hazards that include effluents and emissions from domestic and industrial activities and biological and chemical weapons. The USMA Environmental Engineering program is fully sanctioned by the Accreditation Board of Engineering and Technology (ABET) and an opportunity to complete the first step in professional engineering licensure, the Fundamental of Engineering Exam (FEE), is offered prior to graduation.



Main Point of Contact: Dr. Mike Butkus, WH5317, ext 2820, email: bm8375

GEOSPATIAL INFORMATION SCIENCE:

Fundamental to understanding our environment and the geography of the Earth is our ability to locate, measure, and quantify geographic phenomena. The discipline of geospatial information science (GIS) is concerned with the measurement of the earth and of all that is on it--natural and man-made. Cadets develop expertise in subjects ranging from traditional methods of land surveying to satellite imaging and positioning systems. The GIS curriculum builds on a firm math, science, and geography foundation with specialized courses in surveying, cartography, photogrammetry, remote sensing, and geographic information systems. The curriculum culminates with the integration of all forms of geospatially-referenced data in a GIS capstone course. Both the civil and military sectors of our society are placing an ever-increasing reliance on the ability to build and query geospatial information to support a myriad of social/economic and engineering issues. The cadet at USMA has a rare opportunity to pursue an integrated field of study that is commonly spread over several separate disciplines at other institutions. This major has applicability for the future military officer regardless of branch. The curriculum prepares cadets for advanced civil schooling in any of the specialized fields of GIS.



Main Point of Contact: Dr. John Brockhaus, WH5302, ext 2063, email: bj9296

**GEOGRAPHY AND ENVIRONMENTAL ENGINEERING
FACULTY COUNSELORS FOR AY03-04**

<u>Program:</u>	<u>Field Counselor:</u>	<u>Office:</u>	<u>Phone:</u>
Human/Regional Geography, Environmental Geography, & Foreign Area Studies	LTC Galgano	W5304	4035
Environmental Engineering & Science	COL Manous	W5324	2930
Geospatial Information Science	Dr. Brockhaus	W5302	2063
Counseling & Scheduling Problems	MAJ Lahood	W5400	5421

<u>Course No:</u>	<u>Course Title:</u>	<u>Course Director/ Counselor:</u>	<u>Office:</u>	<u>Phone:</u>
EV 203	Physical Geography	LTC Hummel	W5303B	3161
EV 300	Environmental Science	LTC Lynch	W5320	5126
EV 301	Environmental Science for Engineers and Scientists	Dr. Johnson	W5416	4855
EV 303	Foundations in Geography	Dr. Malinowski	W5323	4673
EV 350	Environmental Technologies	CPT Talbot	W5332	4265
EV 365	Cultural and Political Geography	MAJ Lahood	W5400	5421
EV 371	Geography of Russia	MAJ Cowher	W5319	3986
EV 372	Geography of Asia	Dr. Malinowski	W5323	4673
EV 373	Geography of Latin America	CPT Reding	W5312	3093
EV 374	Geography of the Middle East and Africa	MAJ Lahood	W5400	5421
EV 377	Remote Sensing	Dr. Brockhaus	W5302	2063
EV 378	Cartography	MAJ Edson	W5409	4869
EV 379	Photogrammetry	MAJ Edson	W5409	4869
EV 380	Principles of Surveying	MAJ LaBranche	W5411	3531
EV 384	Geography of North America	COL Palka	W6001	4354

<u>Course No:</u>	<u>Course Title:</u>	<u>Course Director/ Counselor:</u>	<u>Office:</u>	<u>Phone:</u>
EV 385B	Introduction to Environmental Engineering	LTC Lynch	W5320	5126
EV 386	Geography of Europe	LTC Dalton	W5304	3403
EV 388A	Physical Geology	Dr. Johnson	W5416	4855
EV 388B	Geomorphology	LTC Gilewitch	W5415	4400
EV 389B	Climatology	MAJ Read	W5332	3166
EV 389H	Met and Air Pollution	MAJ Martino	W5411	2326
*EV390A	Environmental Science	LTC McDonald	W5412	3735
EV 390B	Urban Geography	CPT Forn	W5321	3540
EV 391A	Principles of Land-Use Planning and Management	CPT Larkin	W5316	3094
EV 391B	Environmental Geology	Dr. Johnson	W5416	4855
EV 394	Hydrogeology	CPT Guerrie	W5400	3124
EV 396	Environmental Biological Systems	Dr. Butkus	W5317	2820
EV 398	Geographic Information Systems	CPT Bailey	W5414	4620
EV399A	Geology Field Course	Dr. Johnson	W5416	4855
EV 401	Physical and Chemical Treatment	MAJ Starke	W5400	3042
EV 402	Biochemical Treatment	MAJ Baumeister	W6003	4622
EV 450	Environmental Decision Making	COL Manous	W5324	2930
EV 471	Ecology	LTC Houston	W6006	3938
EV 477	Advanced Remote Sensing	Dr. Brockhaus	W5302	2063
EV 481	Water Resources Planning and Design	COL Manous	W5324	2930
EV 482	Military Geography	LTC Galgano	W5304	4035

<u>Course No:</u>	<u>Course Title:</u>	<u>Course Director/ Counselor:</u>	<u>Office:</u>	<u>Phone:</u>
EV 483	Colloquium in Geography	Dr. Malinowski	W5323	4673
EV 485	Special Topics in Geography And the Environment	Based upon course subject matter		
EV 486	Environmental Geography	Dr. Anderson	W5311	3509
EV 487	Environmental Security	COL King	W6000	4658
*EV 487A	Seminar in Environmental Geography	Dr. Anderson	W5311	3509
*EV 487B	Seminar in GIS	Dr. Brockhaus	W5302	2063
*EV 487C	Seminar in Environmental Science	COL King	W6000	4658
EV 488	Solid & Hazardous Waste Treatment and Remediation	CPT Guerrie	W5400	3124
EV 489A	Advanced Individual Study in Geography	LTC Galgano	W5303	4035
EV 489B	Advanced Individual Study in GIS	Dr. Brockhaus	W5302	2063
EV 489C	Advanced Individual Study of the Environment	COL Manous	W5324	2930
EV 490	Advanced Environmental Process Design	COL Manous	W5324	2930
EV 498	Advanced Geographic Information Systems	Dr. Brockhaus	W5302	2063
XS 391	Principles and Applications of Environmental Chemistry	Dr. Butkus	W5317	2820

* For the Class of 2004

Visit our Department Web Pages

Main: <http://www.dean.usma.edu/geo/gene.htm>

Geography: <http://www.dean.usma.edu/geo/Geog/geomain.htm>

Environmental: http://www.dean.usma.edu/geo/Env_Eng/Environmental.htm

Geospatial Informational Sciences: <http://www.dean.usma.edu/geo/gis/gis.htm>

HUMAN/REGIONAL GEOGRAPHY

HUMAN/REGIONAL GEOGRAPHY MAJOR (NVB) HUMAN/REGIONAL GEOGRAPHY FIELD OF STUDY (NGB)

- Complete the 26-course core curriculum.
- Complete any 3-course core engineering sequence.
- Complete one (1) of the two (2) following courses:

Course #	Course Title
IT 305	Theory and Practice of Military IT Systems
IT 355	Advanced Theory and Practice of Military IT Systems

- Complete the five (5) following courses:

Course #	Course Title
EV 303	Foundations in Geography
EV 365	Cultural and Political Geography
EV 398	Geographic Information Systems
EV 482	Military Geography
LX	Third Semester of Foreign Language

- **Regional Geography**
Complete two (2) of the following six (6) courses. Selection should be based upon identified regional interest.

Course #	Course Title
EV 371	Geography of Russia
EV 372	Geography of Asia
EV 373	Geography of Latin America
EV 374	Geography of the Middle East and Africa
EV 384	Geography of North America
EV 386	Geography of Europe

- **Physical Geography**
Complete one (1) of the three (3) following courses:

Course #	Course Title
EV 388A	Physical Geology
EV 388B	Geomorphology
EV 389B	Climatology

- **Geospatial Information Science (GIS)**
Complete one (1) of the two (2) following courses:

Course #	Course Title
EV 377	Remote Sensing
EV 378	Cartography

- Complete the following integrative experience course:

Course #	Course Title
EV 483	Colloquium in Geography

- Cadets pursuing a **FIELD OF STUDY** have completed their program.

Cadets pursuing a **MAJOR** must complete three (3) courses from the Human/Regional Geography Electives list below. Courses chosen from this list must be consistent with selected regional focus or systematic focus per guidance from Departmental counselor.

HUMAN/REGIONAL GEOGRAPHY ELECTIVES

Course #	Course Title
EV 371	Geography of Russia
EV 372	Geography of Asia
EV 373	Geography of Latin America
EV 374	Geography of the Middle East and Africa
EV 377	Remote Sensing
EV 378	Cartography
EV 384	Geography of North America
EV 386	Geography of Europe
EV 388B	Geomorphology
EV 389B	Climatology
EV 389H	Meteorology and Air Pollution
EV 390B	Urban Geography
EV 391A	Principles of Land Use Planning and Management
EV 391B	Environmental Geology
EV 485	Special Topics in Geography and the Environment
EV 489A	Advanced Individual Study in Geography
EP 333	Cultural Studies
EP 392	Ethnic Literature
HI 360	History of the Classical World
HI 361	History of the Medieval World
HI 362	Politics and Society in Early Modern Europe
HI 363	Europe in Transition/Revolution, 1648-1950
HI 366	Diplomatic History of Europe
HI 367	History of Imperial and Soviet Russia
HI 371A	History of France in Modern Times, 1848-1968
HI 371D	History of Imperial and Nazi Germany, 1866-1945
HI 371E	Great Britain in the 19th and 20th Centuries
HI 372	History of U.S. Foreign Relations in 20th Century
HI 375	History of China
HI 377	History of Asian Warfare
HI 379	History of Latin America
HI 380	History of the Middle East
HI 391	History of World Religions
HI 394	History of Revolutionary America
HI 395	History of Civil War America
HI 396	The Making of Modern America
HI 397	History of Cold War America
HI 398	Society and Culture in American History

HUMAN/REGIONAL GEOGRAPHY ELECTIVES (Continued)

Course #	Course Title
LW 481	International Law
LX	Foreign Language Elective Courses
MS 360	Low Intensity Conflict
MS 455	Comparative Military Systems
PL 371	Introductory Sociology
PL 377	Social Inequality: Race, Gender, and Ethnicity
SS 360	Political Analysis
SS 366	Comparative Politics
SS 371	Politics and Governments of East Asia
SS 375	Politics and Governments of Former Soviet Union
SS 377	European Politics
SS 381	Political and Cultural Anthropology
SS 383	Politics and Governments of the Middle East
SS 384	Politics and Governments of Latin America
SS 385	Comparative Economic Systems
SS 485	Politics and Development in Sub-Saharan Africa



Cadet participation in a Shinto cleansing ritual entering the Meiji Shrine (below) during the SE Asia AIAD



**(above photo)
USMA and Uzbek Cadets at war memorial commemorating Soviet airborne forces during Republic of Uzbekistan AIAD**

ENVIRONMENTAL GEOGRAPHY

ENVIRONMENTAL GEOGRAPHY MAJOR (NVE) ENVIRONMENTAL GEOGRAPHY FIELD OF STUDY (NGE)

- Complete the 26-course core curriculum.
- Complete any 3-course core engineering sequence.
- Complete one (1) of the two (2) following courses:

Course #	Course Title
IT 305	Theory and Practice of Military IT Systems
IT 355	Advanced Theory and Practice of Military IT Systems

- Complete the seven (7) following courses.

Course #	Course Title
EV 301	Environmental Science for Scientists and Engineers*
EV 303	Foundations in Geography
EV 365	Cultural and Political Geography
EV 389B	Climatology
EV 398	Geographic Information Systems
EV 482	Military Geography
EV 486	Environmental Geography

* EV301 is either taken as part of the Environmental Engineering sequence or as a directed elective.

- **Physical Geography**
Complete one (1) of the two (2) following courses:

Course #	Course Title
EV 388A	Physical Geology
EV 388B	Geomorphology

- **Regional Geography**
Complete one (1) of the six (6) following courses:

Course #	Course Title
EV 371	Geography of Russia
EV 372	Geography of Asia
EV 373	Geography of Latin America
EV 374	Geography of the Middle East and Africa
EV 384	Geography of North America
EV 386	Geography of Europe

- **Geospatial Information Science (GIS)**
Complete one (1) of the two (2) following courses:

Course #	Course Title
EV 377	Remote Sensing
EV 378	Cartography

- Complete the following integrative experience course:

Course #	Course Title
EV 487	Environmental Security

- Cadets pursuing a **FIELD OF STUDY** have completed their program with the options above.

- Cadets pursuing a **MAJOR**, complete three (3) courses from the Environmental Geography Electives list below.

ENVIRONMENTAL GEOGRAPHY ELECTIVES

Course #	Course Title
EV 371	Geography of Russia
EV 372	Geography of Asia
EV 373	Geography of Latin America
EV 374	Geography of the Middle East and Africa
EV 377	Remote Sensing
EV 378	Cartography
EV 379	Photogrammetry
EV 380	Principles of Surveying
EV 384	Geography of North America
EV 385B	Introduction to Environmental Engineering
EV 386	Geography of Europe
EV 388A	Geology
EV 388B	Geomorphology
EV 389H	Meteorology and Air Pollution
EV 390B	Urban Geography
EV 391A	Principles of Land Use Planning and Management
EV 391B	Environmental Geology
EV 394	Hydrogeology
EV 399A	Geology Field Course
EV 481	Water Resources Planning and Design
EV 485	Special Topics in Geography and the Environment
EV 489A	Advanced Individual Study in Geography
EP 384	Environmental Ethics
LW 473	Environmental Law Seminar
LX	Foreign Language Elective Courses

Cadet activities during SE Asia AIAD



**Cadets climbing Mt. Fuji, Japan
in early morning fog**



**Cadets at the Buddhist Temple
Wat Phra Sam Yot in Lopburi, Thailand**

ENVIRONMENTAL SCIENCE

ENVIRONMENTAL SCIENCE MAJOR (MJA)

ENVIRONMENTAL SCIENCE FIELD OF STUDY (MGA)

- Complete the 26-course core curriculum.
- Complete any 3-course core engineering sequence offered at USMA.
- Complete one (1) of the two (2) following courses:

Course #	Course Title
IT 305	Theory and Practice of Military IT Systems
IT 355	Advanced Theory and Practice of Military IT Systems

- Complete the nine (9) following courses. Cadets must select either EV388A or EV399A to fulfill this requirement.

Course #	Course Title
CH 385	Introduction to Biology
EV 301	Environmental Science for Engineers and Scientists
EV 365	Cultural and Political Geography
EV 377	Remote Sensing
EV 388A OR EV 399A	Physical Geology OR Geology Field Course
EV 389H	Meteorology and Air Pollution
EV 398	Geographical Information Systems
EV 471	Ecology
EV 487	Environmental Security

- Complete two (2) of the six (6) following Environmental Science Directed Electives: Cadets who are taking the EV CES cannot take EV385B nor EV481.

Course #	Course Title
EV 385B	Introduction to Environmental Engineering
EV 389B	Climatology
EV 391B	Environmental Geology
EV 396	Environmental Biological Systems
EV 481	Water Resources Planning and Design
XS 391	Principles and Applications of Environmental Chemistry

- Cadets pursuing a **MAJOR** will also complete the following course:

Course #	Course Title
LW 473	Environmental Law Seminar

- Cadets pursuing a **MAJOR** and who are taking the EV CES will complete two (2) courses from the following list of Environmental Science Field Electives. Cadets pursuing a **MAJOR** and who are NOT taking the EV CES will complete one (1) course from the following list of Environmental Science Field Electives.

ENVIRONMENTAL SCIENCE FIELD ELECTIVES

Course #	Course Title
CE 302	Statics and Dynamics
CE 380	Hydrology/Hydraulic Design
CH 357	Microbiology
CH 383	Organic Chemistry I
CH 384	Organic Chemistry II
CH 387	Human Physiology
CS 382A	Computing for the Engineer and Scientist

ENVIRONMENTAL SCIENCE ELECTIVES (continued)

Course #	Course Title
EM 381	Engineering Economy
EP 384	Environmental Ethics
EV 378	Cartography
EV 380	Principles of Surveying
EV 384	Geography of North America
EV 386	Geography of Europe
EV 388B	Geomorphology
EV 389B	Climatology
EV 390B	Urban Geography
EV 391A	Principles of Land Use Planning and Management
EV 391B	Environmental Geology
EV 394	Hydrogeology
EV 396	Environmental Biological Systems
EV 401	Physical and Chemical Treatment
EV 481	Water Resources Planning and Design
EV 482	Military Geography
EV 485	Special Topics in Geography and the Environment (w/approval)
EV 489C	Advanced Ind. Study of the Environment (w/approval)
LW 481	International Law
MA 363	Ordinary Differential Equations
MA 366	Vector Calculus and Introduction to PDE
MA 376	Applied Statistics
ME 301	Thermodynamics
ME 362	Fluid Mechanics
MS 350	Military Communications
SS 480	The Public Policy Making Process
SS 485	Politics of Developing Nations
XS 391	Principles and Applications of Environmental Chemistry



Cadets at the Continental Divide during EV399A – Field Geology Course

ENVIRONMENTAL ENGINEERING

ENVIRONMENTAL ENGINEERING MAJOR (MJC)

ENVIRONMENTAL ENGINEERING FIELD OF STUDY (MJF)

- Complete the 26-course ABET core curriculum.
- Environmental Engineering **FIELD OF STUDY ONLY** must complete one (1) of the two (2) following courses:

Course #	Course Title
IT 305	Theory and Practice of Military IT Systems
IT 355	Advanced Theory and Practice of Military IT Systems

- Complete the ten (10) following courses. Cadets must select either EV388A or EV399A to fulfill this requirement.

Course #	Course Title
CE 302	Statics and Dynamics
ME 362	Fluid Mechanics
EV 301	Environmental Science for Engineers and Scientists
EV 388A OR EV 399A	Physical Geology OR Geology Field Course
EV 396	Environmental Biological Systems
EV 401	Physical and Chemical Treatment
EV 481	Water Resources Planning and Design
EV 490	Advanced Environmental Process Design
MA 366	Vector Calculus and Introduction to PDE
XS 391	Principles and Applications of Environmental Chemistry

- Environmental Engineering **MAJORS** must also complete all six (6) of the following courses. Environmental Engineering **FIELD OF STUDY** must complete only two (2) of the following courses to fulfill the Environmental Engineering Directed Elective requirement.

Course #	Course Title
CE 380	Hydrology and Hydraulic Design
ME 301	Thermodynamics
EV 389H	Meteorology and Air Pollution
EV 394	Hydrogeology
EV 402	Biochemical Treatment
EV 488	Solid and Hazardous Waste Treatment and Remediation

- Both **MAJORS** and **FIELD OF STUDY** must complete one (1) of the following courses to satisfy the Environmental Engineering Field Elective requirement.

ENVIRONMENTAL ENGINEERING FIELD ELECTIVES

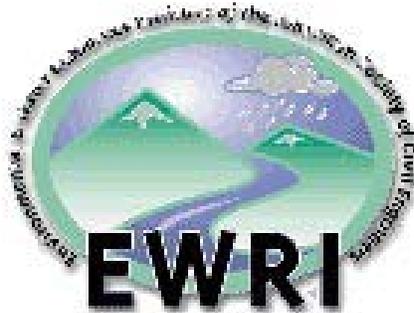
Course #	Course Title
CE 364	Mechanics of Materials
CH 357	Microbiology
CS 382A	Computing for the Engineer and Scientist
CS 383	Information Systems
EE 301	Fundamentals of Electrical Engineering
EM 380	Engineering Materials
EM 381	Engineering Economy
EM 411	Project Management
EV 377	Remote Sensing

ENVIRONMENTAL ENGINEERING ELECTIVES (Continued)

Course #	Course Title
EV 380	Surveying
EV 388B	Geomorphology
EV 391B	Environmental Geology
EV 398	Geographic Information Systems
EV 485	Special Topics in Geography and the Environment (with approval)
EV 489C	Advanced Individual Study of the Environment (with approval)
ME 380	Engineering Materials
SE 375	Statistics for Engineers
SE 385	Decision Analysis



Environmental Majors learning about air pollution during the EV389H Field Trip to the Bayway Refinery



Join the USMA Chapter of Environmental Water Resources Institute (EWRI)

GEOSPATIAL INFORMATION SCIENCE

GEOSPATIAL INFORMATION SCIENCE MAJOR (MJS) GEOSPATIAL INFORMATION SCIENCE FIELD OF STUDY (MGS)

- Complete the 26-course core curriculum.
- Complete any available 3-course core engineering sequence.
- Complete one (1) of the two (2) following courses:

Course #	Course Title
IT 305	Theory and Practice of Military IT Systems
IT 355	Advanced Theory and Practice of Military IT Systems

- Complete the eight (8) following courses:

Course #	Course Title
EV 303	Foundations in Geography
EV 365	Cultural and Political Geography
EV 377	Remote Sensing
EV 378	Cartography
EV 379	Photogrammetry
EV 380	Surveying
EV 398	Geographic Information Systems
EV 487	Environmental Security

- Cadets pursuing a **MAJOR**, complete the two (2) following courses:

Course #	Course Title
EV 477	Advanced Remote Sensing
EV 498	Advanced Geographic Information Science

- Cadets pursuing a **MAJOR**, complete three (3) of the courses from the Geospatial Information Science electives list. Cadets pursuing a **FIELD OF STUDY**, complete two (2) of the courses from the Geospatial Information Science electives list.

GEOSPATIAL INFORMATION SCIENCE ELECTIVES

Course #	Course Title
CS 300	Computer Science Fundamentals
CS 382A	Computing for the Engineer and Scientist
CS 382B	Microcomputing for the General User
EE 300	Fundamentals of Digital Logic
EV 3 00	Environmental Science
EV 371	Geography of Russia
EV 372	Geography of Asia
EV 373	Geography of Latin America
EV 374	Geography of the Middle East and Africa
EV 384	Geography of North America
EV 385B	Introduction to Environmental Engineering
EV 386	Geography of Europe
EV 388A OR EV 399A	Physical Geology OR Geology Field Course
EV 388B	Geomorphology

GEOSPATIAL INFORMATION SCIENCE ELECTIVES (Continued)

Course #	Course Title
EV 389B	Climatology
EV 389H	Meteorology and Air Pollution
EV 390B	Urban Geography
EV 391A	Principles of Land Use Planning and Management
EV 391B	Environmental Geology
EV 477	Advanced Remote Sensing
EV 481	Water Resources Planning and Design
EV 482	Military Geography
EV 485	Special Topics in Geography and the Environment
EV 489B	Advanced Independent Study in GIS
EV 498	Advanced Geographic Information Science
IS 383	Fundamentals of Information Systems
MA 391	Mathematical Modeling
MA 476	Mathematical Statistics
PH 365	Modern Physics
PH 381	Intermediate Classical Mechanics
PH 382	Intermediate Electricity and Magnetism
PH 384	Applied Optics
PH 472	Space and Astrophysics
SE 382	Introduction to Problem Solving
SE 385	Decision Analysis

*NOTE: Cadets may select either EV388A or EV399A from group, but not both.



Cadets receive hands-on GIS experience at the US Army Topographic Engineering Center in Alexandria VA

**DEPARTMENT OF GEOGRAPHY AND ENVIRONMENTAL
ENGINEERING COURSE OFFERINGS**

Course #	Course Title	TERMS	041	042	051	052	061	062	071	072
EV203	Physical Geography		x	x	x	x	x	x	x	x
EV300	Environmental Science		x		x		x		x	
EV301	EV Sci for Engineers and Scientists		x		x		x		x	
EV303	Foundations in Geography		x		x		x		x	
EV350	Environmental Technologies			x		x		x		x
EV365	Cultural and Political Geography		x	x	x	x	x	x	x	x
EV371	Geography of Russia		x		x		x		x	
EV372	Geography of Asia			x		x		x		x
EV373	Geography of Latin America		x		x		x		x	
EV374	Geography of Middle East & Africa			x		x		x		x
EV377	Remote Sensing		x	x	x	x	x	x	x	x
EV378	Cartography		x		x		x		x	
EV379	Photogrammetry			x		x		x		x
EV380	Principles of Surveying		x	x	x	x	x	x	x	x
EV384	Geography of North America		x		x		x		x	
EV385B	Introduction to Env Engineering			x		x		x		x
EV386	Geography of Europe			x		x		x		x
EV388A	Physical Geology		x	x	x	x	x	x	x	x
EV388B	Geomorphology			x		x		x		x
EV389B	Climatology		x		x		x		x	
EV389H	Meteorology and Air Pollution			x		x		x		x
EV390A	Environmental Science		x							
EV390B	Urban Geography			x		x		x		x
EV391A	Principles of Land Use Plan & Mngt		x		x		x		x	
EV391B	Environmental Geology			x		x		x		x
EV394	Hydrogeology		x		x		x		x	
EV396	Environmental Biological Systems			x		x		x		x
EV398	Geographic Information Systems			x		x		x		x
EV399A	Geology Field Course		Academic Individual Advanced Development							
EV401	Physical and Chemical Treatment			x		x		x		x
EV402	Biochemical Treatment		x	x	x		x		x	
EV450	Environmental Decision Making				x		x		x	
EV471	Ecology		x		x		x		x	
EV477	Advanced Remote Sensing			x		x		x		x
EV481	Water Resource Planning & Design		x	x	x		x		x	
EV482	Military Geography			x		x		x		x
EV483	Colloquium in Geography			x		x		x		x
EV485	Topics: Geo and the Environment		x	x	x	x	x	x	x	x
EV486	Environmental Geography				x		x		x	
EV487	Environmental Security					x		x		x
EV487A	Seminar in Env Geography			x						
EV487B	Seminar in GIS			x						
EV487C	Seminar in Environmental Science			x						
EV488	Solid and Hazardous Waste T&R			x		x		x		x
EV489A	AIS in Geography		x	x	x	x	x	x	x	x
EV489B	AIS in GIS		x	x	x	x	x	x	x	x
EV489C	AIS of the Environment		x	x	x	x	x	x	x	x
EV490	Advanced Env Process Design			x		x		x		x
EV498	Advanced GIS				x		x		x	
XS391	Principles and Applications of Environmental Chemistry		x		x		x		x	

DEPARTMENT OF GEOGRAPHY AND ENVIRONMENTAL ENGINEERING

COURSE DESCRIPTIONS

EV 203	PHYSICAL GEOGRAPHY
	3.0 Credit Hours (BS=2.0,ES=1.0); Prerequisite: MS102

SCOPE: Physical Geography is a core course in physical geography, which provides cadets with a fundamental understanding of scientific principles and processes of earth science, meteorology, climatology, geomorphology and environmental systems, as well as an introduction to cultural geography. Further, the course furnishes cadets with the technical skills – digital terrain analysis, image interpretation and spectral analysis, remote sensing, global positioning system, geographic information systems, cartography – to delineate the geographic distribution of landforms, weather, climate, and culture systems; and evaluate their potential impact on military operations. Lessons are reinforced by extensive use of in- and out-of-class practical exercises, terrain walks and computer exercises to demonstrate the interrelationship between physical and human systems, and their impact on the environment. Historical vignettes are employed to demonstrate how the factors of weather, climate, terrain, soils, vegetation and culture are important, cogent and frequently decisive in military operations.

LESSONS: 36 @ 55 min (2.5 Att/wk)

LABS: 4 @ 55 min

SPECIAL REQUIREMENTS: None

EV 300	ENVIRONMENTAL SCIENCE
Env CES Course	3.0 Credit Hours; Prerequisite: EV203; Disqualifiers: EV301 or EV390A

SCOPE: As the introductory course to the Environmental Engineering Sequence, EV300 provides the cadet with a broad understanding of what the term “environment” includes and how influences, especially anthropogenic, cause changes in the natural balance of the earth’s chemical and biological cycles. Special attention is focused on those “environmental influences” causing the greatest detrimental effects to human and wildlife health along with techniques used for evaluating the level of risk associated with these influences. Discussions of anthropogenic influences are conducted with consideration of social, economic, and political impacts. Cadets learn to evaluate literature on environmental issues through readings and interactive debates. A course project applying the scientific method to evaluate a current environmental problem provides an opportunity to tie multiple course topics with an in-depth study of an issue of interest. Offered Only in Fall Semester beginning AY 2005.

LESSONS: 40 @ 55 min (2.5 Att/wk)

LABS: None

SPECIAL REQUIREMENTS: Design project evaluating the environmental impact of a proposed project.

EV 301	ENVIRONMENTAL SCIENCE FOR ENGINEERS AND SCIENTISTS
Env CES Course for Engineers and Scientists	3.0 Credit Hours (BS=1.0, ES=1.5, ED=0.5); Prerequisites: EV203, Environmental Engineering, Environmental Science, Environmental Geography, Engineering Management Major or Permission of the Course Director; Disqualifiers: EV300 or EV390A

SCOPE: This course is similar to EV300, but takes a more quantitative approach to the subject material. EV301 provides the cadet with a broad understanding of what the term “environment” includes and how influences, especially anthropogenic, cause changes in the natural balance of the earth’s chemical and biological cycles. Special attention is focused on those “environmental influences” causing the greatest detrimental effects to human and wildlife health along with techniques used for evaluating the level of risk associated with these influences. Discussions of anthropogenic influences are conducted with consideration of social, economic, and political impacts. Cadets learn to evaluate literature on environmental issues through readings and interactive debates. A course project applying the scientific method to evaluate a current environmental problem provides an opportunity to tie multiple course topics with an in-depth study of an issue of interest. Offered Only in Fall Semester beginning AY2005.

LESSONS: 40 @ 55 min (2.5 Att/wk)

LABS: 2 Field Trips, 2 In-class Labs

SPECIAL REQUIREMENTS: Design project evaluating the environmental impact of a proposed project.

EV 303	FOUNDATIONS IN GEOGRAPHY
	3.0 Credit Hours; Prerequisite: None

** To be taken in 5th academic term for all cadets choosing a Human/Regional Geography, Environmental Geography or Geospatial Information Science FOS/MAJ*

SCOPE: This course presents the basic concepts, theories and methods of inquiry in the discipline of geography as a foundation for advanced study in Human/Regional Geography, Environmental Geography, or Geospatial information science. The course includes models and concepts from the many sub-disciplinary (systematic) areas of geography to include cultural, historical, economic, urban, political and military geography. The application of concepts to real-world issues is emphasized. Research skills and techniques used by professional geographers are presented. Cadets use these approaches to spatially analyze and map the distribution of human and environmental phenomena. Several short papers will be assigned.

LESSONS: 40 @ 55 min (2.5 Att/wk)

LABS: None

SPECIAL REQUIREMENTS: Requires Department Head approval for all cadets not selecting a FOS/MAJ in the Department of Geography & Environmental Engineering.

EV 350	ENVIRONMENTAL TECHNOLOGIES
Env CES Course	3.0 Credit Hours (BS= 0.0, ES=0.0, ED=0.0), Prerequisites: CH102 or CH152, MA205 or MA255, and EV300 or EV301, Disqualifiers: EV385B

SCOPE: This second course in the Environmental Engineering Sequence continues the discussion of environmental issues introduced in EV300/EV301 and builds on that knowledge by defining environmental engineering and studying it from a unit process and materials balance approach. Through the study of water (transport, quality, drinking water treatment, and wastewater treatment); air (transport, quality, and pollutant minimization); and pollutant management (solid and hazardous wastes), the cadet is exposed to the breadth of the environmental discipline. A laboratory experience is integral to the course. In the laboratory, water quality is defined and measures of physical, chemical, and biological quality are both discussed and measured. An introductory design problem is developed through the semester on a relevant topic.

LESSONS: 36 @ 55 min (2.5 Att/wk)

LABS: 6 @ 120 min

SPECIAL REQUIREMENTS: One design project.

EV 365	CULTURAL AND POLITICAL GEOGRAPHY
	3.0 Credit Hours; Prerequisite: EV203

SCOPE: This course provides the geographic foundation for study in interdisciplinary and management academic areas. Contemporary regions of the world political map serve as the framework within which geographic concepts and analytical techniques are applied. Each cadet will develop an awareness of the diversity and distribution of people on the earth, human organization and exploitation of territory, and interactions among culture groups. Particular emphasis is placed on social institutions, their impact on economic development, and the subsequent identification and analysis of developed, emerging, and underdeveloped states.

LESSONS: 38 @ 55 min (2.5 Att/wk)

LABS: 2 @ 55 min

SPECIAL REQUIREMENTS: One research paper.

EV 371	GEOGRAPHY OF RUSSIA
	3.0 Credit Hours; Prerequisite: EV365

SCOPE: This course examines the political, economic, and cultural geography of Russia and its adjacent neighbors; the Baltic States, East Central European region, Transcaucasus, and Central Asia. Topics covered include: the Commonwealth of Independent States; ecocide in the former Soviet Union; disposition of the former Soviet military; and ethnic rivalries. The objective of the course is to provide the student with an understanding of the recent past of the traditional Soviet system in order to understand, as well as geographically evaluate, Russia's and the other former republics' situation today.

LESSONS: 40 @ 55 min (2.5 Att/wk); 1 field trip

LABS: None

SPECIAL REQUIREMENTS: One oral report; compensatory time provided.

EV 372	GEOGRAPHY OF ASIA
	3.0 Credit Hours; Prerequisite: EV365

SCOPE: The course studies the physical and cultural environment of Asia with emphasis on those geographic elements related to the region's progress, developing nations, and emerging world and regional powers. Topics covered include a consideration of the physical and resource base, environmental and cultural factors, spatial organization of agricultural and industrial economies, population patterns and problems, and examination of the realm's several major subregions.

LESSONS: 40 @ 55 min (2.5 Att/wk); 1 field trip

LABS: None

SPECIAL REQUIREMENTS: One written report and one oral presentation; compensatory time provided.

EV 373	GEOGRAPHY OF LATIN AMERICA
	3.0 Credit Hours; Prerequisite: EV365

SCOPE: This course studies the physical and cultural landscape of Latin America, giving special treatment to the diversity and cultural identity of the region. Topics covered include a historical geography of the region, including Pre-Columbian civilizations, Iberian, African, and European influences; the geography of transportation networks, agriculture, urbanization, and population. National boundaries, major landforms and climatic conditions are discussed to describe their effect on civilization. This course also investigates the historical relationship between the United States and Latin America, and covers recent U.S. military interventions in the region.

LESSONS: 40 @ 55 min (2.5 Att/wk)

LABS: None

SPECIAL REQUIREMENTS: One oral report; compensatory time provided.

EV 374	GEOGRAPHY OF THE MIDDLE EAST AND AFRICA
	3.0 Credit Hours; Prerequisite: EV365

SCOPE: The course examines Middle Eastern and African landscapes to include expressions of their dominant physical and cultural forms. The variety of Middle Eastern and African peoples are studied in a geographic context--tracing their origins, dispersal, spatial organization, the intrusion of alien cultures and the diversity of human use and resource exploitation of the land. Among issues examined are the distribution and strategic significance of critical mineral and energy resources, population and food disparities, nation-building programs and prospects, and regional development plans. The course concludes with study of the changing internal geographic patterns, extraregional spatial relationships, and geostrategic implications of East-West competition in these unstable regional environments.

LESSONS: 40 @ 55 min (2.5 Att/wk); 1 field trip

LABS: None

SPECIAL REQUIREMENTS: One oral presentation supported by a written report; compensatory time provided.

EV 377	REMOTE SENSING
	3.0 Credit Hours (ES=2.5, ED=0.5); Prerequisite: EV203, CS105 or equivalent knowledge

SCOPE: Remote Sensing is learning about something without touching it--the most obvious example being the use of satellites to study the Earth. EV377, a techniques course applicable to both the humanities and engineering, studies how and what types of information can be carried by the electromagnetic spectrum. Students enjoy a wide range of practical exercises which introduce them to several remote sensing systems to include conventional and color infrared photography, multispectral scanners, satellite imagery, thermal infrared, and radar. The capstone exercise offers each student the opportunity to perform real-time automated image classification using satellite data on his/her own microcomputer. The final few lessons of the course encompass the military airborne and spaceborne remote sensing platforms and national systems. The course focus is on applying remotely sensed data to solve current problems.

LESSONS: 35 @ 55 min (2.5 Att/wk)

LABS: 5 @ 55 min

SPECIAL REQUIREMENTS: None

EV 378	CARTOGRAPHY
	3.0 Credit Hours (ES=2.5, ED=0.5); Prerequisite: EV203, CS105 or equivalent knowledge

SCOPE: Cartography teaches the principles of cartographic communication and enables the student to apply map design principles along with computer mapping techniques to solve contemporary problems in geography, economics, international relations, and applied sciences. Cadets will study the basic cartographic design process and use mapping and analysis software in the Geographic Sciences Laboratory to produce topographic and thematic maps. A final course design project presents the opportunity for the cadets to demonstrate their ability to synthesize sound mapping principles.

LESSONS: 23 @ 55 min (2.5 Att/wk)

LABS: 17 @ 120 min

SPECIAL REQUIREMENTS: Course project included in lab periods.

EV 379	PHOTOGRAMMETRY
	3.0 Credit Hours (BS=0.5, ES=2.5); Prerequisite: EV203, CS105 or equivalent knowledge

SCOPE: Photogrammetry, the art and science of making accurate measurements on photographs, is an important and fundamental discipline concerned with civilian and military mapping. Students, applying simple geometric principles to the photograph, determine object identity, size, spatial relationship, and position. An abundance of practical exercises, involving the use of sophisticated equipment, provide the opportunity to apply the fundamentals while arriving at solutions to real-world problems. An interesting field trip to a local mapping organization vividly displays how all these techniques may be blended to produce maps in the commercial business world.

LESSONS: 30 @ 55 min (2.5 Att/wk)

LABS: 10 @ 55 min

SPECIAL REQUIREMENTS: None

EV 380	PRINCIPLES OF SURVEYING
	3.0 Credit Hours (BS=0.5, ES=2.0, ED=0.5); Prerequisite: NONE

SCOPE: A framework for understanding and applying practical surveying methods is developed. Consideration of error theory provides practical knowledge concerning the concepts of precision and accuracy and yields understanding of the probabilistic nature of measurements. Principles of tachometry, differential leveling, taping, electronic distance measurements, and angular measurements are studied and applied using modern surveying equipment. Traverse, triangulation, trilateration, level networks, and the proper adjustment of related measurements are examined. Field artillery survey, route survey, horizontal and vertical highway curves, topographic survey, computer-aided mapping, and building construction layout are included. Extensive use of laboratory periods permits application of measurement concepts, analytical methods, and planning skills to actual field situations. Global positioning system instruments are used and the principles of satellite positioning are discussed.

LESSONS: 30 @ 55 min (2.5 Att/wk)

LABS: 10 @ 115 min

SPECIAL REQUIREMENTS: None. Also offered for credit as an Academic Individual Advanced Development course during AIAD period 1 each summer.

EV 384	GEOGRAPHY OF NORTH AMERICA
	3.0 Credit Hours; Prerequisite: EV365

SCOPE: This course provides a regional geography of North America, with balanced coverage of the human and physical geography of the United States and Canada. Lectures are appropriately supplemented with movies, slides, and maps to facilitate understanding of important themes that are prevalent in various subregions. Emphasis is placed on cultural patterns and contemporary environmental issues.

LESSONS: 40 @ 55 min (2.5 Att/wk)

LABS: None

SPECIAL REQUIREMENTS: One oral presentation; compensatory time provided.

EV 385B	INTRODUCTION TO ENVIRONMENTAL ENGINEERING
	3.5 Credit Hours (ES=2.5, ED=1.0); Prerequisite: CH102, MA205; Corequisites: PH202 (PH204)

SCOPE: The course introduces the cadet to the study of environmental engineering from a unit process and a materials balance approach. Through the study of water (transport, quality, drinking water treatment, and waste- water treatment); air (transport, quality, and pollutant minimization); and pollutant management (solid and hazardous wastes), the cadet is exposed to the breadth of the discipline. A laboratory experience is integral to the course. In the laboratory, water quality is defined and measures of physical, chemical, and biological quality are discussed and measured. An introductory design problem is developed through the semester on a relevant topic. Offered Only in Spring Semester.

LESSONS: 40 @ 55 min (2.5 Att/wk); 2 field trips

LABS: 7 @ 120 min

SPECIAL REQUIREMENTS: Course design project.

EV 386	GEOGRAPHY OF EUROPE
	3.0 Credit Hours; Prerequisite: EV365

SCOPE: The course examines European cultural landscapes, focusing on the environmental and cultural diversity exhibited among the states of modern Europe. Nationalism and the territorial imperative, long recognized as major forces in Europe, are studied from a geographic perspective to include patterns and processes of both regional continuity and change. Emphasis is given to the rapidly developing urbanization and mutual interdependence among countries of Western Europe. West and East European agricultural/industrial resource bases and developmental strategies are compared and contrasted. Specific topics are tailored to current issues and include regional conflict, economic development and trade, and problems of energy and the environment. This course concludes with a study of contemporary European extraregional spatial relationships with other major world culture regions.

LESSONS: 40 @ 55 min (2.5 Att/wk); 1 field trip

LABS: None

SPECIAL REQUIREMENTS: One research paper, one oral report.; compensatory time provided.

EV 388A	PHYSICAL GEOLOGY
	3.0 Credit Hours (BS=1.0, ES=1.5, ED=0.5); Prerequisite: EV203; Disqualifier: EV399A

SCOPE: Primary emphasis in the course is placed on understanding and interpreting the significant geologic processes that act on and within the earth. Topics studied include the formation and identification of minerals and rocks, plate tectonics, rock structures, geologic mapping, and elements of economic geology. Field trips are conducted to illustrate concepts and processes discussed in class. The course is capstoned by a geologic design that uses an interactive geologic exploration computer simulation. The cadet designs a geologic exploration project and develops a program for remediation of an environmental problem.

LESSONS: 30 @ 55 min (2.5 Att/wk); 2 field trips

LABS: 10 @ 110 min

SPECIAL REQUIREMENTS: One design project; compensatory time provided.

EV 388B	GEOMORPHOLOGY
	3.0 Credit Hours (BS=1.0, ES=1.5, ED=0.5); Prerequisite: EV203

SCOPE: This course examines the processes that create landforms on the surface of the earth and their regional and global distributions. The course focuses on geomorphic processes and their inter-relationships with geology, soils, and climate. Processes emphasized include physical and chemical weathering, and landscape evolution due to water, wind, waves and ice. Each student prepares and presents a final research project synthesizing these geomorphic processes and how they relate to real-world applications.

LESSONS: 40 @ 55 min (2.5 Att/wk); 2 field trips

LABS: None

SPECIAL REQUIREMENTS: One research project; compensatory time provided.

EV 389B	CLIMATOLOGY
	3.0 Credit Hours; Prerequisite: EV203

SCOPE: This course provides a comprehensive introduction to weather processes resulting in distinctive climates. Beginning with an examination of the basic physical and chemical principles of the atmosphere, stressing the heat budget of the earth and atmospheric motion, the course leads to an examination of global climates. Additionally, students will examine climate anomalies and climate oscillations such as El Nino-Southern Oscillation (ENSO) events. The theory of global warming is examined from an objective standpoint considering a variety of climate feedback mechanisms. The course culminates by examining Pleistocene climate change in terms of the structure and operation of the atmosphere-earth-ocean system.

LESSONS: 40 @ 55 min (2.5 Att/wk)

LABS: None

SPECIAL REQUIREMENTS: One research project; compensatory time provided.

EV 389H	METEOROLOGY AND AIR POLLUTION
	3.0 Credit Hours (BS=0.5, ES=2.0, ED=0.5); Prerequisite: EV203

SCOPE: This course begins by exploring fundamental principles of meteorology, to include topics such as atmospheric composition and structure, winds, clouds, and precipitation. The meteorology subcourse culminates with themes ranging from severe weather and aviation hazards to meteorological satellite imagery interpretation and weather forecasting. The semester continues with a detailed study of air pollution, a distinct yet closely related subject within the realm of atmospheric science. Sources, atmospheric dispersion, and various controls of particulate and gaseous pollutants are addressed in both a qualitative and quantitative manner. Offered Only in Spring Semester.

LESSONS: 40 @ 55 min (2.5 Att/wk)

LABS: In-class labs

SPECIAL REQUIREMENTS: None.

EV 390A	ENVIRONMENTAL SCIENCE
	3.0 Credit Hours (BS=1.0, ES=1.5, ED=0.5); Prerequisite: EV203

SCOPE: The semester begins with an introduction to ecology and the laws of nature to establish a firm basis for how the natural system functions. A short block on health allows cadets to identify how risk assessment is used to develop environmental laws and how these laws are translated into regulations. A block on energy has cadets explore the consequences of non-renewable energy sources and their possible alternatives. The final block of the course covers pollution including topics such as urbanization, solid waste, acid rain, global warming, and tropospheric ozone creation. Cadets practice evaluating literature on environmental issues through readings and interactive debates. A course project utilizing the scientific method to evaluate a current environmental problem at West Points allows cadets the opportunity to tie multiple course topics together with an in-depth study of an issue of interest. Offered Only in Fall Semester of AY 2004.

LESSONS: 40 @ 55 min (2.5 Att/wk)

LABS: In-class Labs

SPECIAL REQUIREMENTS: Major science project evaluating an environmental subject relevant to the USMA reservation.

EV 390B	URBAN GEOGRAPHY
	3.0 Credit Hours; Prerequisite: NONE

SCOPE: This course examines the location, function, structure, growth and interactions of urban areas. Spatial techniques are used to explore the internal attributes of cities, as well as their connectivity to other places. While the primary focus is on urbanization within the United States, primate cities abroad are often used for comparative purposes. Emphasis is placed on contemporary urban problems, particularly environmental issues and social disparities.

LESSONS: 40 @ 55 min (2.5 Att/wk)

LABS: None

SPECIAL REQUIREMENTS: One oral presentation; compensatory time provided.

EV 391A	PRINCIPLES OF LAND USE PLANNING AND MANAGEMENT
	3.0 Credit Hours (BS=1.5, ES=1.0, ED=0.5); Prerequisite: EV203

SCOPE: An introduction to land use planning and management with focus on the land-law interfaces between the physical, cultural, and legal realms. The course surveys the policies and legislative basis for land use controls at the federal and regional levels to include national parks and forests, agricultural lands, rangelands, and military training areas. The environmental and economic impacts of these controls are explored. Urban and suburban planning and zoning are also addressed. The importance of geographic concepts is emphasized in the conduct of applied case studies addressing land use conflicts and environmental strategies.

LESSONS: 40 @ 55 min (2.5 Att/wk); 1 field trip.

LABS: None

SPECIAL REQUIREMENTS: One oral presentation; compensatory time provided.

EV 391B	ENVIRONMENTAL GEOLOGY
	3.0 Credit Hours (BS=1.0, ES=1.5, ED=0.5); Prerequisite: EV203

SCOPE: This course focuses on natural phenomena that pose hazards to people. The cause, nature, and occurrence frequency of natural hazards such as flooding, earthquakes, hurricanes, and volcanic activity will be examined. Emphasis will also be placed on how people perceive and respond to these hazards. Land use policies and practices in these hazard areas will also receive attention. Students will participate in map based laboratory exercises.

LESSONS: 37 @ 55 min (2.5 Att/wk)

LABS: 3 @ 55 min

SPECIAL REQUIREMENTS: One research project.

EV 394	HYDROGEOLOGY
	3.5 Credit Hours (ES=2.5, ED=1.0); Prerequisite: EV203

SCOPE: Hydrogeology covers the principles governing the movement of subterranean water (groundwater), the interaction of this water with a porous medium, and the transport of chemical constituents (contaminants) by this flow. This course explores traditional background elements of hydraulic engineering, well drawdown, engineering applications, and the use of computers to model groundwater flow and contaminant plumes. All course material will contribute to modeling a specific situation and developing recommendations for cleaning up contaminated groundwater. Offered Only in Fall Semester.

LESSONS: 40 @ 55 min (2.5 Att/wk)

LABS: 12 @ 55 min (Double Hour)

SPECIAL REQUIREMENTS: None.

EV 396	ENVIRONMENTAL BIOLOGICAL SYSTEMS
	3.5 Credit Hours (BS=1.0, ES=2.5); Prerequisites: CH102 or CH152, EV203 and EV300 or EV301 or EV385B

SCOPE: This course examines biology from a practical environmental engineering and environmental science perspective. The foci of the course are applied public health, microbiology and microbial energetics. Specific topics include the biological health issues associated with drinking water, microbial aspects of industrial and domestic waste treatment and protection or restoration of natural water bodies from environmental contaminants. Students are also introduced to medical geography and the spatial biological health issues associated with a deployment. Laboratory exercises are used to introduce the student to water quality analyses and practices commonly used in the fields of environmental engineering and the environmental sciences.

LESSONS: 40 @ 55 min (2.5 Att/wk)

LABS: 10 @ 55 min (Double Hour)

SPECIAL REQUIREMENTS: None.

EV 398	GEOGRAPHIC INFORMATION SYSTEMS
	3.0 Credit Hours (ES=2.0, ED=1.0); Prerequisites: EV377 or EV378, or permission of the Head of the Department of Geography and Environmental Engineering

SCOPE: Geographic Information Systems are hardware/software systems that permit the input, storage, retrieval, manipulation, analysis, and display of geocoded data. Used by environmentalists, engineers, land-use planners, architects, managers of large land holdings, and the military, these highly- intricate "decision support" systems assist managers in answering important "what if" questions. Using digitizers and microcomputers students will build a geocoded database and solve "real-world" problems.

LESSONS: 33 @ 55 min (2.5 Att/wk)

LABS: 7 @ 55 min

SPECIAL REQUIREMENTS: Short oral reports, one database design; compensatory time provided.

EV 399A	GEOLOGY FIELD COURSE
	3.0 Credit Hours (BS=1.5, ES=1.5, ED=0.0); Prerequisite: EV203; Disqualifier: EV388A

SCOPE: The geology field course is a three-week long summer Individual Advanced Development Program. It is taught in the Rocky Mountain region of the western United States. Geologic concepts are presented in a classroom setting and supplemented with laboratory exercises. The majority of the course, however, is conducted at actual geologic sites in the field where concepts are illustrated and expanded. The course provides the cadet with knowledge of and appreciation for the science of geology as well as practical experience in geologic mapping using remote sensing and GIS. Field trips to active mines and a Superfund site relate classroom learning to the real world.

LESSONS: Variable

LABS: Variable

SPECIAL REQUIREMENTS: TDY travel to the course location in the western USA; excursions to remote field locations; one graded geologic mapping exercise and engineering design. Offered as an Academic Individual Advanced Development course.

EV 401	PHYSICAL AND CHEMICAL TREATMENT
	3.5 Credit Hours; (ES=2.0, ED=1.5); Prerequisite: XS391; Corequisite: ME362

SCOPE: This course takes a process approach to environmental engineering using engineering science and design of drinking water treatment systems as the primary foci. Building upon understandings gained from environmental chemistry, cadets will study physical and chemical processes used in environmental engineering. Discussion includes the theories behind these processes and the design procedures involved in their application. The health implications associated with drinking water and water treatment in contingency operations and applicable occupational health issues are discussed during the course. Cadets, working in teams, develop a comprehensive concept design of drinking water treatment processes. While the focus of the course is drinking water treatment, the processes developed are also applicable to wastewater treatment, groundwater remediation, air pollution control, and the treatment of solid and hazardous wastes. Offered Only in Spring Semester.

LESSONS: 40 @ 55 min (2.5 Att/wk); 1 field trip

LABS: 10 @ 55 minutes (Double Hour)

SPECIAL REQUIREMENTS: One term project.

EV 402	BIOCHEMICAL TREATMENT
	3.5 Credit Hours (ES=2.0, ED=1.5); Prerequisites: EV396 and ME362

SCOPE: This course provides cadets with the opportunity to apply the principles of microbiology to the protection and improvement of the environment. This course builds on the concepts learned in EV396, Environmental Biological Systems, and directly applies those concepts to the treatment of wastewater, removal of nutrients from wastewater, anaerobic digestion, bioremediation, industrial waste treatment, and emerging applications of biological treatment and modeling. A comprehensive, multi-step design project serves as the design experience for this course. Offered Only in Spring Semester beginning AY 2005.

LESSONS: 40 @ 55 min (2.5 Att/wk)

LABS: 7 x 120 minutes (RSTU Lab)

SPECIAL REQUIREMENTS: Engineering design project with a written and oral report.

EV 450	ENVIRONMENTAL DECISION MAKING
Env CES Course	3.0 Credit Hours; Prerequisites: EV350 and standing as a First Class Cadet; Disqualifier: EV481

SCOPE: The third course in the three-course Environmental Engineering sequence and is concerned with the balance of engineered solutions with economic, socio-cultural, political, and ecological considerations evaluated during a decision-making process. Using management of water resources as a teaching model, the realities of decision-making and policy development for all areas of engineering, and particularly environmental engineering, are examined. The course begins with instruction on the tools available to water resource managers and then assesses needs for structural (engineered) and non-structural approaches to meet those needs. Elements of engineering design and the design process are introduced as well as methods of conducting tradeoff analyses. The course makes use of case studies of current water resource projects and includes a term project. Visiting speakers are employed to present views of government and concerned public interest groups. Offered Only in Fall Semester beginning AY 2005.

LESSONS: 40 @ 55 min (2.5 Att/wk)

LABS: None

SPECIAL REQUIREMENTS: Written and oral research reports on a water resources project. No term end.

EV 471	ECOLOGY
	3.0 Credit Hours; (BS=1.0, ES=0.5, ED=0.0); Prerequisites: CH385, EV300 or EV301, EV350 or EV385B

SCOPE: The semester begins with an introduction to ecosystems. Ecosystems are examined through the study of energy flow, biochemical cycles, primary productivity and high order productivity. The interaction within and between species is examined through a study of populations and communities. The evolution of species and ecosystems completes the study of ecology. Throughout the course the role of surface water and watersheds within ecosystems is emphasized. Offered Only in Fall Semester.

LESSONS: 40 @ 55 min (2.5 Att/wk)

LABS: In-class labs and field trips

SPECIAL REQUIREMENTS: Term paper examining aspects of one of the world's ecosystems.

Compensatory time provided

EV 477	ADVANCED REMOTE SENSING
	3.0 Credit Hours; (ES=2.0, ED=1.0); Prerequisites: EV203, EV377

SCOPE: This course examines advanced remote sensing theory and digital image processing techniques suitable for the processing of remotely sensed data. Emphasis is on the processing and analysis of state-of-the-art spatial and spectral resolution data gathered by airborne and satellite sensors. Topics covered include geometric and radiometric image rectification; registration and resampling techniques, image enhancements, data merging, image segmentation, and automated feature extraction. A wide range of practical exercises and in-class laboratory assignments provides hands-on experience with a variety of remotely sensed imagery from multi-spectral to hyper-spectral data. The course culminates with a capstone term project that allows students to apply digital image processing skills to a scientific problem.

LESSONS: 40 @ 55 min (2.5 Att/wk)

LABS: In-Class Labs

SPECIAL REQUIREMENTS: Term project; compensatory time provided.

EV 481	WATER RESOURCES PLANNING AND DESIGN
	3.0 Credit Hours; (ES=2.0, ED=1.0); Prerequisites: Standing as a First Class Cadet; Disqualifiers: EV450

SCOPE: The course is concerned with the effective use of water as a manageable natural resource and it begins with discussion concerning the varied uses of water and the structural (engineered) and non-structural approaches available to meet these needs. The bulk of the course is concerned with assessment of the impacts of various water resource development activities on the economic, socio-cultural and ecological sectors of the environment. Methods for conducting tradeoff analyses among the engineered and environmental aspects of projects are developed and applied in a term project. The course makes use of case studies of current water resource projects and includes visiting speakers to present views from government and public interest groups. Offered Only in Fall Semester beginning AY 2005.

LESSONS: 40 @ 55 min (2.5 Att/wk)

LABS: None

SPECIAL REQUIREMENTS: Written and oral research reports on a water resources project. No term end.

EV 482	MILITARY GEOGRAPHY
	3.0 Credit Hours; Prerequisite: EV203

SCOPE: Military history is replete with examples of the influence of terrain, weather, climate and the cultural landscape on combat. The problems of war and every aspect of any military enterprise are immutably linked to geography. This course examines those links. Wars are fought to gain control over land, resources and peoples of the world. More recently, military undertakings by this nation have incorporated a wide range of Operations Other Than War (OOTW). Notwithstanding its purpose, the conduct of a military endeavor is conditioned by the character of the area of operations -- *the military operating environment*. This course focuses on the synergy between geography and military operations, and emphasizes the development of a geographic methodology for systematic analyses of military operating environments. Case studies and guest lectures are used to examine the impact of weather, climate, terrain and the cultural landscape on military operations from the tactical to strategic level. Further, the course investigates the subjects of geopolitics, geostrategy and strategic choke points, as well as environmental security and military lands.

LESSONS: 40 @ 55 min (2.5 Att/wk)

LABS: None

SPECIAL REQUIREMENTS: One written research project.

EV 483	COLLOQUIUM IN GEOGRAPHY
	3.0 Credit Hours; Prerequisite: EV203, EV365

SCOPE: The colloquium is a directed readings course using small group discussions of important literature, methodological traditions, and contemporary research trends in the field of geography. Dependent on instructor preference and individual student interest, in-depth readings will be pursued in one or more of the following areas of geographic study: cultural, political, regional or military geography. Compensatory time is given to permit extra readings.

LESSONS: 40 @ 55 min (2.5 Att/wk)

LABS: None

SPECIAL REQUIREMENTS: A research proposal and its oral presentation.

EV 485	SPECIAL TOPICS IN GEOGRAPHY AND THE ENVIRONMENT
	3.0 Credit Hours; Prerequisite: EV203, and permission of the professor

SCOPE: This course explores an advanced topic in Human and Regional Geography, Environmental Geography, Environmental Science, Environmental Engineering, or Geospatial Information Science. Specific subject matter will vary with the expertise of the visiting professor or senior faculty member conducting the course.

NOTE: EV485 will be taught as Environmental Biology during AY 03-04.

LESSONS: 40 @ 55 min (2.5 Att/wk)

LABS: None

SPECIAL REQUIREMENTS: As specified by instructor.

EV 486	ENVIRONMENTAL GEOGRAPHY
	3.0 Credit Hours; Prerequisite: EV203, EV365

SCOPE: Whereas physical geographers focus on the earth's surface and atmosphere, and human geographers concentrate on the spatial aspect of human activities, environmental geographers are interested in both how people adapt to specific environments and how they alter those environments through human activities. To understand these interactions and their implications, environmental geographers must fully appreciate natural processes and landform development within and on the surface of the earth, as well as the implications of human intervention in the natural system.

LESSONS: 40 @ 55 min (2.5 Att/wk)

LABS: None

SPECIAL REQUIREMENTS: None.

EV 487	ENVIRONMENTAL SECURITY
	3.0 Credit Hours; Prerequisite: Standing as a First Class Cadet

SCOPE: This course is the integrative experience for environmental geographers, environmental scientists and geospatial information scientists. This interdisciplinary seminar uses Environmental Security in a case study approach to study environmental issues potentially affecting U.S. National Security. Cadets will explore environmental security topics such as water and natural resource shortages, energy use and dependency, global climate change, and other regional environmental issues, using an interdisciplinary approach from geographic, social, political, economic, and scientific-technological perspectives. The course includes several guest speakers and culminates with a interdisciplinary team project. Offered Only in Spring Semester beginning AY 2005.

LESSONS: 40 @ 55 min (2.5 Att/wk)

LABS: None

SPECIAL REQUIREMENTS: Student will present case studies and a geographic analysis of an Army installation.

EV 487A	SEMINAR IN ENVIRONMENTAL GEOGRAPHY
	3.0 Credit Hours; Prerequisite: EV203

SCOPE: Whereas, physical geographers focus on the earth's surface and atmosphere, and human geographers concentrate on the spatial aspect of human activities, environmental geographers are interested in both how people adapt to specific environments and how they alter those environments through human activities. To understand these interactions and their implications, environmental geographers must fully appreciate natural processes and landform development within and on the surface of the earth, as well as the implications of human intervention in the natural system.

LESSONS: 40 @ 55 min (2.5 Att/wk)

LABS: None

SPECIAL REQUIREMENTS: One oral presentation and one research paper (compensatory time provided)

EV 487B	SEMINAR IN GEOSPATIAL INFORMATION SCIENCE
	3.0 Credit Hours; Prerequisite: EV203

SCOPE: Geospatial Information Science involves the design and use of information systems for the collection, management, and analysis of information that has a spatial dimension. This course addresses the processes and issues associated with the development and integration of geospatial information databases. A design project is used as the vehicle for gaining an understanding of these processes and issues. This project brings together advanced field survey technologies, global positioning systems, digital photogrammetry, remote sensing, and geographic information systems in the development of a geospatial database for the West Point military reservation. This course will help cadets develop into army officers who understand the technologies being utilized to generate the digital battlefield of the future and who are aware of the capabilities and limitations of these systems.

LESSONS: 40 @ 55 min (2.5 Att/wk)

LABS: None

SPECIAL REQUIREMENTS: Design project

EV 487C	SEMINAR IN ENVIRONMENTAL SCIENCE
	3.0 Credit Hours; Prerequisite: EV203

SCOPE: This is an interdisciplinary capstone course in the environmental science major. This course is based on topical readings, case studies, and projects with threads in environmental security and/or environmental management. Interdisciplinary connections, depending on projects and readings, may include links to life sciences, environmental geography, geospatial information sciences, and environmental engineering.

LESSONS: 40 @ 55 min (2.5 Att/wk)

LABS: None

SPECIAL REQUIREMENTS: As determined by instructor

EV 488	SOLID AND HAZARDOUS WASTE MANAGEMENT AND REMEDIATION
	3.0 Credit Hours (ES=1.0, ED=2.0); Prerequisites: EV394 and EV402

SCOPE: This course examines the treatment, storage and disposal of solid and hazardous wastes. Both regulatory requirements and evolving technology associated with solving modern solid waste disposal problems are discussed. Processes for the investigation and remediation of contaminated waste sites are presented, along with design methodologies for solid and hazardous waste disposal systems. The course culminates in the application of hazardous waste engineering to the cleanup of a contaminated hazardous disposal site. Offered Only in Spring Semester.

LESSONS: 40 @ 55 min (2.5 Att/wk)

LABS: None

SPECIAL REQUIREMENTS: One design project and a research paper.

EV 489	TOPICS IN ADVANCED INDIVIDUAL STUDY
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SCOPE: The course offers the cadet a variety of topics for advanced individual study in the areas of: Geography; Geospatial information science; or the Environment. Topics are generally unique to the cadet's interest and represent a real-world project. See EV489A, EV489B, and EV489C.

EV 489A	ADVANCED INDIVIDUAL STUDY IN GEOGRAPHY
	3.0 Credit Hours; Prerequisite: Permission of the Geography Program Director

SCOPE: The course is an individually supervised research and study program designed to provide the cadet the opportunity to pursue advanced study of topics or regions in geography. The cadet prepares a research and study proposal setting forth the objectives, scope, and anticipated accomplishments of his/her efforts for the semester. Once approved, the proposal serves as a basis for the cadet's research and study program. Progress in research reports and observations by the faculty advisor form the basis for grades. The program for each cadet usually culminates in a substantive research paper and oral defense.

LESSONS and LABS: Established by consultation between cadet and faculty advisor.

SPECIAL REQUIREMENTS: As determined by faculty advisor.

EV 489B	ADVANCED INDIVIDUAL STUDY IN GEOSPATIAL INFORMATION SCIENCE
	3.0 Credit Hours; Prerequisite: Permission of the Head of the Department

SCOPE : The course is an individually supervised research and study program designed to provide the cadet the opportunity to pursue advanced study of Geospatial information science. The cadet prepares a research and study proposal setting forth the objectives, scope, and anticipated accomplishments of his/her efforts for the semester. Once approved, the proposal serves as a basis for the cadet's research and study program. Progress in research reports and observations by the faculty advisor form the basis for grades. The program for each cadet usually culminates in a substantive research paper and oral defense.

LESSONS and LABS: Established by consultation between cadet and faculty advisor .

SPECIAL REQUIREMENTS: As determined by the faculty advisor.

EV 489C	ADVANCED INDIVIDUAL STUDY OF THE ENVIRONMENT
	3.0 Credit Hours; Prerequisite: Permission of the Head of the Department

SCOPE: The course is an individually supervised research and study program designed to provide the cadet the opportunity to pursue advanced study of the environment. The cadet prepares a research and study proposal setting forth the objectives, scope, and anticipated accomplishments of his/her efforts for the semester. Once approved, the proposal serves as a basis for the cadet's research and study program. Progress in research reports and observations by the faculty advisor form the basis for grades. The program for each cadet usually culminates in a substantive research paper and oral defense.

LESSONS and LABS: Established by consultation between the cadet and the faculty advisor.

SPECIAL REQUIREMENTS: As determined by the faculty advisor.

EV 490	ADVANCED ENVIRONMENTAL PROCESS DESIGN
	3.5 Credit Hours (ES=1.0, ED=2.5); Prerequisites: Standing as a First Class Cadet in Environmental Engineering or Permission of the Department Head

SCOPE: This is the capstone design course for the major in environmental engineering. It exposes cadets to the complete design experience including project management using the Corps of Engineers model, project cost estimating, work scheduling, and development of plans and specifications. Projects are examined at the feasibility and concept design phases to show evolution and development through the design cycle. Environmental sampling theory based on statistical analysis is introduced as a tool fundamental to the analysis of environmental problems. Two designs are completed during the term. Each requires the production of a solution to a real world problem. A laboratory study is required to develop the data necessary to understand the problems and produce the design criteria. Project teams are developed and work management is a specific task of the team. Oral and written technical presentations of findings and design packages are the final deliverables of this course. This course is intended to develop a cadet's confidence in solving real world environmental problems. Offered Only in Spring Semester.

LESSONS: 40 @ 55 min a (2.5 Att/wk)

LABS: 12 @ 55 minutes (Double Hour)

SPECIAL REQUIREMENTS: Three design problems.

EV 498	ADVANCED GEOGRAPHIC INFORMATION SCIENCES
	3.0 Credit Hours (ES=2.0, ED=1.0); Prerequisite: EV398

SCOPE: This course examines the analytical methods used in Geographic Information systems (GIS) and provides cadets with a clear understanding of the theoretical/conceptual aspects of algorithms found in GIS software. Lectures focus on the underlying mathematical basis for widely used spatial analytical techniques. Among the topics covered are neighborhood operations, map transformation, spatial interpolation, terrain analysis, network analysis, spatial overlay, fuzzy sets, neural networks, and expert systems. In-class practical exercises and laboratory assignments compliment the lectures by providing hands-on experience with a variety of advanced analytical techniques. The course culminates with a capstone term project that allows cadets to identify a scientific problem, formulate a hypothesis, use GIS to solve the problem, and then present the results of their analysis.

LESSONS: 30 @ 55 min (2.5 Att/wk)

LABS: 10 @ 55 Min

SPECIAL REQUIREMENTS: Term Project. Compensatory time provided.

XS 391	PRINCIPLES AND APPLICATIONS OF ENVIRONMENTAL CHEMISTRY
	3.0 Credit Hours (BS=1.0, ES=2.0); Prerequisites: CH102 or CH 152, MA103 or MA153, and MA104

SCOPE: This course will examine chemical interactions of pollutants in air, soil, and water systems. The focus of the course is problem solving with the following topic coverage: approximately 80% applied aquatic chemistry, 15% environmental organic chemistry, and 5% applied analytical chemistry. Specific topics include the chemistry applied in drinking water production and the chemical aspects of industrial and hazardous waste treatment. The fate of heavy metals and organic contaminants in soil and aqueous systems will also be covered. Offered Only in Fall Semester.

LESSONS: 40 @ 55 min a (2.5 Att/wk)

LABS: One In-class lab

SPECIAL REQUIREMENTS: None



Grand Canyon

Cadets on Four Corners AIAD



What state are you in?



Cadets prepare and tour USMA's wastewater treatment plant on Environmental Engineering field trip



Cadets survey USMA landmark



during a Surveying field laboratory

GEOGRAPHY AND ENVIRONMENTAL ENGINEERING FACULTY

COLONEL W. CHRIS KING

Professor USMA and Head, Department of
Geography and Environmental Engineering

Ph.D., University of Tennessee, 1988
M.S., Tennessee Technological University,
1974
M.A., Naval War College, 2000
B.S. Chem. E., Tennessee Technological
University, 1972
P.E., State of Minnesota, 1980
Diplomate, American Academy of
Environmental Engineers, 1995



Medical Operations Planner, Operation
Support Hope, 1994
OIC, Health Risk Assessment Team,
Southwest Asia (SWA), 1991
Chief, Env Health Div, USA Env Hygiene Agency, MD, 1988-91
Asst Cdr, USA Engr Div, Huntsville, AL, 1984-85
Program Manager, USA Engr Div, Huntsville, AL, 1981-84
Engr Staff Off, USAREUR & 7th Army, Germany, 1978-81
Sanitary Engr, USA Env Hygiene Agency, Aberdeen Proving Grounds, MD, 1974-78

COL King was appointed as a permanent associate professor in environmental engineering in November 1991 and promoted to Professor of Discipline in 1996. He was selected to be Head of the department in 1998. He teaches Physical Geography and all of the environmental engineering courses offered in the Department. His professional activities include: Vice Chairman of the committee administering the environmental professional engineer's exam, conducting research in the application of geophysical remote sensing to environmental engineering, and strategic analysis of international environmental security issues. He has authored an environmental engineering handbook, a recent book on strategic international environmental security, and over 30 professional articles.

COLONEL EUGENE J. PALKA

Professor and Deputy Head, Department of
Geography and Environmental Engineering

Ph.D., University of North Carolina at
Chapel Hill, 1995
M.A., Ohio University, 1986
B.S., USMA, West Point, 1978

Deputy Head, D/G&EnE, USMA,
2002 - present

C-5, 10th Mountain Division, CJTF-
Afghanistan, 2002

Geography Program Director, D/G&EnE,
USMA, 1998-2002

Deputy Commander, 16th Cavalry Regiment,
FT Knox, KY, 1997-98

Battalion Commander, 1-46th Infantry
Regiment, FT Knox, KY, 1995-97

Battalion XO, 5-9th Infantry Regiment, FT Wainwright, AK, 1991-92

G3, Chief of Opns, 6th IN Division (Light), FT Wainwright, AK, 1990-91

Battalion S3, 1-501st Infantry, 101st ABN Division, FT Campbell, KY, 1983-84

Company Commander, A/1-501st IN, 101st ABN Division, FT Campbell, KY, 1981-83

PLT Leader, Aide de Camp, Company XO, 101st ABN Div., FT Campbell, KY, 1978-81



COL Palka is an Infantryman, whose military assignments include nearly six years with the 101st Airborne Division, and more than two years with the 6th Infantry Division (Light) in Alaska. More recently, COL Palka commanded the 1st Battalion, 46th Infantry Regiment at Fort Knox, and subsequently served as the Deputy Commander of the 16th Cavalry Regiment. From February to April 2002, he was assigned to the 10th Mountain Division and deployed to Afghanistan to serve as the C-5, Future Plans Officer, for the Coalition Joint Task Force, CJTF-Afghanistan. COL Palka is a human geographer, with expertise in military and environmental geography, and regional expertise in North America and Latin America. He has published seven books, three Instructor's Manuals to accompany college textbooks, three monographs, numerous book chapters, and 35 professional articles on a wide range of military and geographic topics. He has taught most of the geography courses offered in the department. He currently rotates his teaching assignments between Geography of North America, Geography of Latin America, Urban Geography, and Cultural and Political Geography.

COL JOE D. MANOUS, Jr.

Academy Professor and Program Director
Environmental Engineering

Ph.D., University of Minnesota
(Environmental Engineering), 2000
M.S.S., US Army War College, 2003
M.S., University of Illinois (Civil
Engineering), 1989
B.CE., Georgia Institute of Technology (Civil
Engineering), 1980
B.S., North Georgia College (Physics), 1980
P.E., Commonwealth of Virginia, 1984



Special Asst (Engineer Projects) to Deputy
Commanding General, FT Bragg, NC,
1996-97

Battalion XO, 27th Engineer Battalion (Cbt)(Abn), FT Bragg, NC, 1995-96
Area Commander (Central America), Mobile District, USACE, Tegucigalpa,
Honduras, 1993-94

Asst Dean for Policy, USMA, West Point, NY, 1992-93

Company Commander, B/94 Engineer Battalion (Cbt)(Hvy), Darmstadt, FRG, 1985-87

Asst S3, B/94 Engineer Battalion (Cbt)(Hvy), Darmstadt, FRG, 1984-85

Platoon Leader, Company XO, 307th Engineer Battalion (Cbt)(Abn), 82d Airborne
Division, FT Bragg, NC, 1980-1983

COL Manous is an engineer officer with experience in airborne and military construction units as well as engineering duties associated with civil construction and operations on military installations. As a member of the USMA faculty, COL Manous has taught EV203 (Physical Geography), SE381 (Engineering Economy), EV385 (Introduction to Environmental Engineering), EV390A (Environmental Science), EV481 (Water Resources Planning and Design), and EV488 (Solid and Hazardous Waste Management and Remediation). COL Manous' research interests concern water availability, quality, and reuse.

LTC FRANCIS A. GALGANO Jr.

Associate Professor and Program Director,
Geography

Ph.D., University of Maryland, 1998
M.A., University of Maryland, 1989
B.S., Virginia Military Institute, 1980

Senior Staff Advisor, Saudi Arabian
National Guard Modernization
Program, Riyadh, KSA, 2001-2002

Assistant Professor, D/G&EnE, USMA,
1998-2001

XO, 3rd Squadron, 3d Armored Cavalry
Regiment, FT Bliss, Texas, 1995

S3, 3d Squadron, 3d Armored Cavalry
Regiment, FT Bliss, Texas, 1994-1995

Regimental Adjutant, 3d Armored Cavalry
Regiment, FT Bliss, Texas, 1993-1994

Associate Professor, D/G&EnE, USMA,
1989-1992

Company Commander, 1st Bn., 13th Armor, 1986

Company Commander, 2nd Bn., 1st ATB, 1985-1986

Assistant S-3, 3d Brigade, 3d Armored Division, Ray Barracks, Federal Republic of
Germany, 1983

Tank Platoon Leader, Company XO, 1st Bn., 32nd Armor, 3d Brigade, 3d Armored Division,
Ray Barracks, Federal Republic of Germany, 1980-1982



LTC Galgano is an armor officer with command and staff experience in tank and cavalry units at battalion, brigade and regimental level. His recent Field Army experiences have been with the 3d Armored Cavalry Regiment and most recently as a Senior Staff Advisor to the Saudi Arabian National Guard in Riyadh. LTC Galgano is a physical geographer with expertise in coastal geomorphology, military geography and environmental geography. He has published two books, three physical geography study guides, and 20 professional articles focused on geographic and military subjects. He is currently co-authoring a book on coastal processes. In addition, he has presented numerous papers at professional conferences. LTC Galgano's dissertation research included shoreline change mapping of the mid-Atlantic coast from New York to South Carolina to delineate how shorelines move in time and space; and assess the impact of tidal inlets on coastal configuration. He is currently involved in joint research efforts with the International Hurricane Center and U.S. Army Corps of Engineers Coastal and Hydraulics Laboratory at WES. LTC Galgano is the Geography Program Director and serves as the course director for EV482 (Military Geography) and teaches EV203 (Physical Geography). He has taught EV487A (Environmental Geography), and EV365 (Cultural and Political Geography), and has directed several cadet research projects (EV489A).

LTC LAUREL J. HUMMEL
Associate Professor, Geography

Ph.D., University of Colorado 2002
M.Ed., University of Alaska Anchorage 1999
M.S., Penn State University, 1991
B.S., United States Military Academy 1982

Chief, Operations Intelligence Division,
Intelligence Directorate, Alaskan Command,
PACOM, Elmendorf Air Force Base,
Alaska, 1996-1999

S-3, 102d Military Intelligence Battalion, 2d
Infantry Division, ROK, 1995-1996

Instructor and Assistant Professor,
Department of Geography and Environmental
Engineering USMA, 1991-1994

Commander, Headquarters and Headquarters
Company, S-1, and S-2, 224th Military Intelligence Battalion (Aerial Exploitation), 525th
Military Intelligence Brigade (ABN), Hunter Army Airfield, Georgia, 1986-1989
Chief, Intelligence Plans and Production, and Tactical Intelligence Officer, 24th Infantry
Division G-2, Fort Stewart, Georgia, 1985-1986
Platoon Leader and XO, 124th Military Intelligence Battalion, 24th Infantry Division,
Fort Stewart, Georgia, 1983-1985



LTC Hummel has spent the majority of her military career in the fields of tactical, imagery, and strategic intelligence, in Army field units and the joint arena. She is a graduate of the U.S. Army Command and General Staff College and is a Joint Service Officer. As a member of the USMA faculty, she has taught the EV203 (Terrain Analysis, now the Physical Geography), as well as EV365 (Cultural and Political Geography), EV388B (Geomorphology), and EV384 (Geography of North America). She is currently the course director of Physical Geography (EV203). LTC Hummel is primarily a cultural geographer with expertise in landscape studies, geography in higher education, and new dimensions in military geography. She has conducted research in the areas of the influence of the military built environment upon the cultural landscape as well as the decline of small towns in Appalachia. LTC Hummel has a regional interest in the geography of Alaska, and specifically the effects of the militarization of Alaska on Alaska Native people.

LTC JASON C. LYNCH

Associate Professor,
Environmental Engineering

Ph.D., University of Florida (Environmental
Engineering Sciences) 2002

M.E., University of Florida (Environmental
Engineering Sciences) 1993

B.S., United States Military Academy
(Chemistry Concentration) 1984

P.E., Commonwealth of Virginia 1996

Deputy Regimental Rear Commander, 2nd ACR,
FT Polk, LA 1997-98

Regimental Chemical Officer, Adjutant,
Executive Officer, and Liaison Officer, 2nd
Armored Cavalry Regiment, FT Polk, LA
1996-97

Instructor and Assistant Professor, Department
of Geography and Environmental Engineering, USMA 1993-96

System Manager, Program Management NBC Defense Systems, Aberdeen Proving
Grounds, MD 1990-91

Company Commander, 164th Chemical Company (Smoke Generator), I Corps, FT Lewis,
WA 1988-89

Division Chemical NBC Element Director, 9th Infantry Division, FT Lewis, WA 1987-88

Brigade Chemical Officer, 9th Cavalry Brigade, Air Attack, 9th Infantry Division, FT Lewis,
WA 1986-87

Platoon Leader and Executive Officer, 4th Chemical Company (Dual Purpose), 2nd Infantry
Division, Camp Casey, Korea 1985-86



LTC Lynch is a Chemical Corps officer who has served in various command and staff positions in predominantly light infantry and cavalry units. His experiences include a deployment to Bosnia as well as training deployments to JRTC, NTC, CMTC, and Team Spirit, Korea. He also served an acquisition tour working radiac instrument research, development, and testing. LTC Lynch's research interests include field investigation and remediation of hazardous materials as well as environmental policy and management. LTC Lynch is the Environmental Engineering Sequence Coordinator and teaches several EV courses throughout the academic year.

CIVILIAN FACULTY

Dr. PETER G. ANDERSON

Assistant Professor, Environmental Geography

Ph.D., University of Utah, 1994

M.A., State University of New York, Albany, 1983

B.A., State University of New York, Albany, 1980

Assistant Professor, Indiana State University, 2000-2001

Assistant Professor, Central Connecticut University,
1998-2000

Assistant Professor, Northwest Missouri State University,
1997-1998

Assistant Professor, University of Montana, 1995-1997



Dr. Anderson is a physical geographer with teaching and research interests in vegetation ecology, mountain geography, and land use and conservation. Of particular interest are: temperate forest ecology, dynamics, and change at the landscape scale, natural heritage conservation planning, and the application of these concepts in mountain environments. These teaching and research interests have been conducted in the Adirondack Mountains of NY and Grand Teton National Park in WY, and have taken Dr. Anderson to all 50 states and most of the Canadian provinces. He currently teaches EV203 (Physical Geography) and EV487A (Environmental Geography).

Dr. JOHN A. BROCKHAUS

Professor and Program Director,
Geospatial Information Science

Ph.D., University of Idaho, 1987

M.S., California Polytechnic State University, 1980

B.S., California Polytechnic State University, 1978

Research Associate, NCS University, 1984-94

Instructor, University of Idaho, 1982-84

Systems Analyst, Humbolt State University, 1981-82

Instructor, California Polytechnic State University, 1978-80



Dr. Brockhaus is an environmental scientist with teaching and research interests in aerial photo interpretation, remote sensing, and geographic information systems. He has expertise in the application of remote sensing and geographic information systems in the study of landscape characterization, spatial modeling of ecological processes, site degradation monitoring, and land cover change analysis. He has published several articles in professional journals and has presented over 30 papers at national and international conferences. His research interests include site degradation monitoring with remotely sensed data, detection and mapping of invasive plant species using hyperspectral imagery, and the use of ground penetrating radar in archeological studies. He teaches EV377 (Remote Sensing), EV378 (Cartography), EV379 (Photogrammetry), EV398 (Geographic Information Systems) and EV477 (Advanced Remote Sensing).

Dr. MICHAEL A. BUTKUS

Associate Professor, Environmental Engineering

Ph.D., The University of Connecticut, 1997

M.S., The University of Connecticut, 1995

B.S., The United States Merchant Marine Academy, 1989

P.E., State of Connecticut, 1997

Research Associate and Teaching Fellow, UCONN, 1994-97

Nuclear Plant Engineer, Knolls Atomic Power Laboratory,
1990-93



Dr. Butkus is an Environmental Engineer with research focuses on water, wastewater, and hazardous waste treatment system design. He has conducted environmental research for both the military and civilian sectors. His current research interests include remediation of lead on firing ranges, disinfection, and the development of small-scale water treatment devices for the Army. Dr. Butkus is the course director for EV396 (Environmental Biological Systems) and XS391 (Principles and Applications of Environmental Chemistry). He also teaches EV385B (Introduction to Environmental Engineering), EV300/EV390A (Environmental Science), EV401 (Physical and Chemical Treatment), and EV402 (Biochemical Treatment).

Dr. MARIE C. JOHNSON

Associate Professor, Environmental Engineering

Ph.D., Brown University, 1990

AB, *magna cum laude*, Harvard College, 1985

Associate Research Scientist, Lamont-Doherty Earth
Observatory of Columbia University, 1992-95

Lamont-Doherty Postdoctoral Fellow, Lamont-Doherty Earth

Observatory of Columbia University, 1990-92

Research Assistant, Brown University, 1986-90



Dr. Johnson is a Geologist who applies the skills and techniques of physical chemistry to understanding geological processes. Her specific research interests include understanding fluid behavior at high pressures and temperatures inside the Earth, deducing physical conditions inside a volcano just prior to eruption, and hazardous waste disposal. She is the author of many articles in professional journals, and often presents papers at national conferences. She is course director for EV300/EV390A (Environmental Science), EV301 (Environmental Science for Engineers and Scientists), EV391B (Environmental Geology), EV399A (Geology Field Course), EV471 (Ecology), and EV388A (Physical Geology).

Dr. JON C. MALINOWSKI

Associate Professor, Geography

Ph.D., Geography, University of North Carolina at Chapel Hill, 1995

M.S., Geography, University of North Carolina at Chapel Hill, 1993

B.S. Foreign Service, Georgetown University, 1991, *magna cum laude*, Phi Beta Kappa

Teaching Fellow, UNC-Chapel Hill, 1993-95



Dr. Malinowski is a Geographer with teaching and research interests in environmental perception, spatial ability, children's geographies, and the geography of Asia. He is the co-author of two books, several academic journal articles and book chapters. He is also the editor of *Geographic Perspectives: Iraq*. He currently serves as the Human Geography Sub-Group Director. Dr. Malinowski is the course director for EV303 (Foundations in Geography), EV372 (Geography of Asia), and EV483 (Colloquium in Geography).

ROTATING FACULTY

LTC JAMES B. DALTON, JR.

Assistant Professor, Geography

Ph.D., University of Minnesota, 2001

M.A., Naval War College, 1995

M.A., Gannon University, 1991

B.A., Providence College, 1979

Asst. S-3, 3rd Infantry Div Arty, Bamberg, GE,
1993-94

S-3, 2-14th FA Bn (MLRS), Bamberg, GE,
1992-93

Asst. IG, USAEUR & 7th Army, Heidelberg,
GE, 1990-92

APMS, Gannon University, Erie, PA, 1986-90

A/S-3 Ops, 82nd Abn Div Arty, FT Bragg, NC,
1985-86

Commander, B Btry, 1-320th FA Bn (ABN), FT
Bragg, NC, 1983-85

S-4, 1-320th FA Bn (ABN), FT Bragg, NC,
1983

XO, E Btry, 25th FA (TA), 2nd Inf Div, Camp Stanley, Korea 1982

S/F Plt Ldr, E Btry, 25th FA (TA), 2nd Inf Div, Camp Stanley, Korea 1981-82

FDO, A Btry, 1-29th FA Bn (155SP), FT Carson, CO, 1980-81

FSO, C Co, 1-11th Inf Bn (Mech), FT Carson, CO, 1979-80



LTC Dalton is a Field Artillery Officer who has held various positions in both self-propelled and towed divisional artillery units. His artillery assignments range from airborne units to the heavy MLRS. LTC Dalton's academic interests include the effects of culture on national strategy and security issues with regard to transnational natural resources. LTC Dalton is the course director for EV386 (Geography of Europe). He has taught EV203 (Physical Geography), EV303 (Foundations of Geography), and EV365 (Cultural and Political Geography).

LTC DANIEL A. GILEWITCH

Assistant Professor, Geography

PhD, Arizona State University , Tempe AZ, 2003
MA, University of Kansas, Lawrence, KS, 1992
BS, United States Military Academy 1983

Combat Arms Program Manager, Office of
Military Cooperation, Cairo, Egypt, 1998-
2000

S-3, 16th Cavalry Regiment, Fort Knox, KY, 1998

S-3, 1st Squadron, 16th Cavalry Regiment, Fort
Knox, KY, 1997

Instructor and Assistant Professor, D/G&EnE,
USMA, West Point, NY 1993-1996

Commander, A Troop, 1st Squadron, 1st Cavalry Regiment, Ansbach, Federal Republic of
Germany, 1989-1990

S-3 (Air), 1st Squadron, 1st Cavalry, Swabach, Federal Republic of Germany, 1987-1988

S-3 (Training), 3rd Brigade, 4th Infantry Division, Fort Carson, CO, 1986

Company XO, D/4-40 Armor, Fort Carson, CO, 1985

Platoon Leader, D/4-40 Armor, Fort Carson, CO, 1984



LTC Gilewitch is an Armor Officer with experience in a variety of armor and cavalry units. Most of his assignments were in the operational arena, but he recently completed a joint duty assignment in the Arab Republic of Egypt where he managed the Foreign Military Sales Program for all ground combat systems with exception of ADA. His academic background is in both Human (Masters level) and Physical (Doctorate level) Geography. He has experience teaching EV203 (Physical Geography) and EV373 (Latin America). His primary academic interest is in the interaction of arid region geomorphology and military operations.

LTC STEPHEN HOUSTON

Assistant Professor, Environmental Engineering

Ph.D., Colorado State University (Ecology), 2002

M.S., Johns Hopkins University (Environmental Engineering), 1993

B.S., United States Military Academy (Geography Concentration), 1985

EIT, Delaware, 1995

C-3, Aviation Chief, CFLCC and CJTF-7, Kuwait and Iraq, 2002-2003

XO, 6-101 Aviation Battalion, 101st Attack Brigade, 101st Airborne Division (Air Assault), FT Campbell, KY 1998-1999

S3, 6-101 Aviation Battalion, 101st Attack Brigade, 101st Airborne Division (Air Assault), FT Campbell, KY 1997-1998

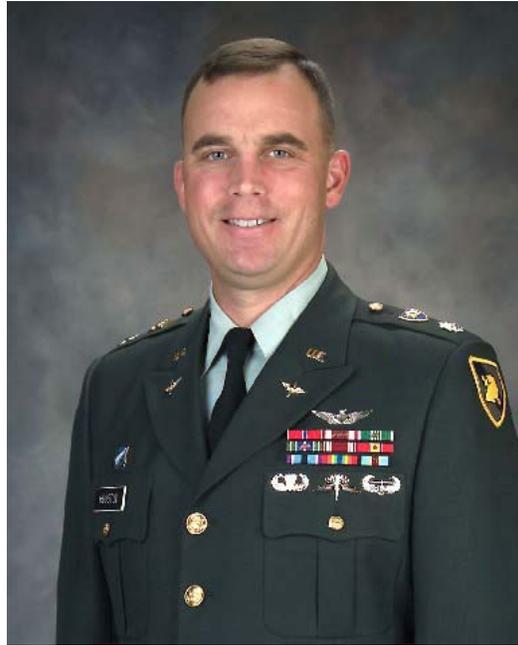
G-3, Chief of Training, 2nd Infantry Division, Camp Red Cloud, Korea, 1996-1997

Instructor and Assistant Professor, Department of Geography and Environmental Engineering, USMA, 1993-1996

Company Commander, B/4-25 Aviation Regiment, 25th Infantry Division (Light), Schofield Barracks, HI, 1989-1990

Assistant S3 and Flight Operations Officer, 53rd Aviation Battalion, 25th Infantry Division (Light), Schofield Barracks, HI, 1988-1989

Platoon leader and Company XO, 17th Assault Helicopter Company (UH60), 25th Infantry Division (Light), Schofield Barracks, HI, 1986-1988



LTC Houston is a Aviation officer who has served in various command and staff positions in light, assault and mechanized infantry divisions. His most recent operational experience was in Kuwait and Iraq as the Aviation Chief for the Coalition Forces Land Component Command (CFLCC) and Coalition Joint Task Force 7 (CJTF-7) during Operation Iraqi Freedom. He has deployed to Western Samoa for disaster relief operations, and to JRTC, NTC, Australia and Korea on numerous training deployments. LTC Houston's research interests include unexploded ordnance and explosives contamination of terrestrial ecosystems associated with ranges and impact areas as well as environmental restoration. He has taught EV385B (Introduction to Environmental Engineering), EV391B (Environmental Geology), and EV203 (Physical Geography). Currently, he is course director for EV471 (Ecology). He also teaches EV300 (Environmental Science).

LTC KENNETH W. MCDONALD

Assistant Professor, Environmental
Engineering

M.S., University of Missouri – Rolla, 2000

M.S., Western Kentucky University, 1995

B.S., USMA, West Point, 1985

P.E., Commonwealth of Virginia, 1990

P.E., Wyoming, 1991

AICP, 1998

Deputy Commander, Base Operations and
Engineering, 19th Theater Support

Command, Camp Henry, Korea, 2001-02

Battalion XO, 577th Engineer Battalion,

FT Leonard Wood, MO, 2000-2001

Battalion S3, 577th Engineer Battalion,

FT Leonard Wood, MO, 1999-2000

Staff Engineer, J4, EUCOM, Stuttgart,

Germany / Kosovo, 1999

Chief, Engineer Division, USAES, FT Leonard Wood, MO, 1998-1999

Assistant ADE, 326th Engineer Battalion, FT Campbell, KY, 1992

Commander, D Company, 20th Engineer Battalion, FT Campbell, KY, 1991-1992

Assistant S3, 20th Engineer Battalion, Saudi Arabia, 1991

Plt Ldr, Spt Plt Ldr, CO XO, 299th Engineer Battalion, FT Sill, OK, 1985-1998



LTC McDonald is an Engineer Officer with diverse background in combat and construction engineering. His academic interests are in geography and environmental engineering; achieving advanced degrees in both areas. His experiences in the Persian Gulf War and Kosovo helped mold his academic interests. He teaches EV203 (Physical Geography), EV300/EV390A, (Environmental Science), and EV487 (Environmental Security). He is directing the efforts of the Center for Environmental and Geographic Sciences (CEGS).

MAJ MICHAEL A. BAUMEISTER

Assistant Professor, Environmental Engineering

M.S., Rensselaer Polytechnic Institute – Troy, NY, 2001

M.A., Webster University – St. Louis, MO, 1996

B.S., USMA, West Point, 1992

EIT, Delaware, 2002

Commander, 98th Maint. Co., FT Richardson, AK, 1997-99

Brigade Maint. Officer, 1/6 ID, FT Wainwright, AK, 1996-97

Maintenance Manager, Corps Material Management Center,
FT Bragg, NC, 1995-96

Ammunition Control Officer, 8th Ordnance Company,
FT Bragg, NC, 1994-95

Platoon Leader, 8th Ordnance Company, FT Bragg, NC, 1993-94

Ammunition Accountable Officer, ROTC Camp All American, FT Bragg, NC, 1993

Platoon Leader, 8th Ordnance Company, FT Bragg, NC, 1992-93



MAJ Baumeister is an Ordnance officer with varied troop and staff ammunition and maintenance experience. He has Masters degrees in Management, Environmental Management and Policy and Environmental Engineering. His thesis is titled "The Development of a Hydrodynamically Based Two-Dimensional Transport Model for Estuaries Using a Collocated Non-Orthogonal Computational Grid" and his continued research interest is focused on modeling of the Hudson River Estuary. MAJ Baumeister is course director for EV402 (Biological Processes) and he teaches EV390A (Environmental Science).

MAJ DENNIS D. COWHER

Assistant Professor, Geography

M.S., Pennsylvania State University, 2001

B.S., USMA, West Point, 1991

Commander, A/1-502nd Infantry, FT Campbell, KY, 1997-99

Assistant S-3, 1-502nd Infantry, FT Campbell, KY, 1996-97

Executive Officer, B/2-7 Infantry, FT Stewart, GA, 1994-95

Anti-armor Plt Ldr, 2/E/2-7 Infantry, FT Stewart, GA, 93-94

Platoon Leader, 1/B/2-7 Infantry, FT Stewart, GA, 1992-93



MAJ Dennis Cowher has served in both mechanized and air assault infantry assignments. He served in the 24th Infantry Division (Mechanized) as a platoon leader, specialty platoon leader, and company executive officer. He participated in several deployments including Operation Vigilant Warrior to Kuwait and two rotations to the National Training Center at Fort Irwin, California. While serving as a staff officer and commander, MAJ Cowher deployed twice to the Joint Readiness Training Center and commanded A/1-502 In during a rotation at the National Training Center. MAJ Cowher is a human geographer and is especially interested in political and economic geography. He wrote his Masters thesis on the impacts of military spending in the United States and used the Johnstown, Pennsylvania region as a case study. MAJ Cowher is course director for EV371 (Geography of Russia) and also teaches EV365 (Cultural and Political Geography).

MAJ CURTIS B. EDSON

Instructor, Geospatial Information Science

M.S., University of Wisconsin - Madison, 2002
B.S., California Polytechnic State University (Cal Poly), 1992
Commander, B Co, 40th En Bn, 1st Armored Division,
Germany, 1998-00
Assistant S-3, 40th En Bn, 1st Armored Div, Germany, 1997-98
S-4, Support Sqdrn, 11th ACR (OPFOR), FT Irwin, CA, 95-96
Executive Officer, 58th En Co, 11th ACR (OPFOR), FT Irwin,
CA, 1994-95
Platoon Leader, A&O/87th En Co 177th AR Bde (OPFOR), FT
Irwin, CA, 1994
Platoon Leader, A and B Companies, 44th En Bn, 2nd Infantry Division, South Korea, 1993



MAJ Edson is an Engineer Officer who has served in combat engineer units and as the S-4 Support Squadron, 11th ACR. He has prior service experience serving as a supply specialist in 75th Ranger Regiment, and in the reserves with 12th Special Forces Group (Airborne). His experiences include company command in Bosnia, several BLUFOR and OPFOR rotations at CMTC, OPFOR at NTC, and service in Korea. MAJ Edson received his Masters Degree in Remote Sensing and Spatial Information Management. His academic interests include remote sensing/environmental monitoring, cartography, photogrammetry, and geographic information systems. His graduate work focused on remote sensing change detection. He is the course director for EV378 (Cartography). He also teaches EV377 (Remote Sensing) and EV398 (Geographic Information Systems).

MAJ JAMES J. JORDANO

Instructor, Environmental Engineering

M.S., Johns Hopkins University, 2002
M.S., University of Missouri – Rolla, 1996
B.S., USMA, West Point, 1992
EIT, Delaware, 2003

Group Engineer, 45th CSG(F), Schofield Barracks, HI, 99-00
Company Commander, HSC, 84th Engineer Combat Battalion
(Heavy), Schofield Barracks, HI, 1998-99
A/BN S3, 84th ECB(H), Schofield Barracks, HI, 1997-98
Battalion S4, 84th ECB(H), Schofield Barracks, HI, 1996-97
Platoon Leader, Assault & Obstacle Platoon Leader, Company XO, BN Adjutant, 19th
Engineer BN (Combat)(Mechanized), Fort Knox, KY, 1992-1995



MAJ Jordano is an Engineer officer who has served in both Mechanized and Combat Heavy Engineer units. His experiences include OPFOR-support at the National Training Center (NTC) and the Joint Readiness Training Center (JRTC). MAJ Jordano commanded a combat heavy engineer company and executed construction missions throughout the Pacific Theater. MAJ Jordano has earned Masters Degrees in Engineering Management and Environmental Engineering. His academic and research interests include hazardous waste management and remediation processes and technologies. MAJ Jordano teaches EV300 (Environmental Science) and EV350 (Environmental Technologies).

MAJ DAVID F. LABRANCHE

Instructor, Geospatial Information Science

M.S., University of New Hampshire, 1994
B.S., Worcester Polytechnic Institute, 1985
EIT, New Hampshire, 1994

Special Assistant to the Commanding General, US Army Corps
of Engineers (USACE), Washington DC, 2000-2002
Battalion XO, 4th Engineer Battalion, FT Carson, CO, 99-2000
Regimental Engineer, 3rd ACR, FT Carson, CO, 1998-99
DPW, ARCENT-Kuwait, Camp Doha, KU 1997-98
Project Officer, Sacramento District, USACE, Sacramento, CA 1994-97
Company Commander, A/39th Engineer BN (Corps)(Wheeled), FT Devens, MA 1990-92
Platoon Leader, Company XO, 23rd Eng BN, 3rd Armored Div, Hanau, FRG, 1986-89



Major LaBranche is an Engineer officer with experience in mechanized and combat construction units, installation support (public works), and virtually all mission areas of the US Army Corps of Engineers. His operational experience includes participation in Operation DESERT THUNDER, on the Third US Army engineer staff under Coalition Joint Task Force - Kuwait. His graduate research involved removal of volatile and semi-volatile organic compounds from water using ShallowTray aeration. He is course director for EV380 (Principles of Surveying).

MAJ ALBERT A. LAHOOD

Assistant Professor, Geography

M.A., Syracuse University - Syracuse, NY 2001
B.S., Salem State College, Salem, MA 1992

Commander, A/10th Engr Bn, FT Stewart, GA, 1997-99
Asst. S-3, 10th Engr Bn, FT Stewart, GA, 1997
Asst. S-3, 937th Engr Grp, Fort Riley, KS, 1996
Executive Officer, 568th Engr Co (CSE), FT Riley, KS, 95-96
Platoon Leader, 55th Engr Co (MGB), FT Riley, KS, 1994-95
Platoon Leader, 34th Engr Bn (C) (H), FT Riley, KS, 1993-94



MAJ Lahood served as an engineer in the 1st Infantry Division, and commanded a combat engineer company in the 3rd Infantry Division at Fort Stewart. He participated in several deployments including the United Nations Mission in Haiti, Operation Desert Fox and the NTC. MAJ Lahood is a human geographer interested in multilateral peacekeeping operations and conflict resolution. He has a Masters degree in Geography and a certificate from the Maxwell School of Citizenship in the Analysis and Resolution of Conflict. His thesis is titled, "The United Nations in the Congo 1960-1964 And The Impact On State Sovereignty As Related To Peacekeeping Missions." MAJ Lahood is course director for EV365 ((Cultural and Political Geography) and also teaches EV374 (Geography of the Middle East and Africa).

Maj MARTIN R. MARTINO (US Air Force)

Assistant Professor, Environmental Engineering

M.S., St. Louis University, 1993

B.S., Indiana State University, 1981

Chief, FORSCOM Weather Staff Operations, FT McPherson
GA, 1996-2000

Chief, Product Improvement Branch, HQ AWS, Scott AFB IL,
1994-96

Manager, Numerical Weather Prediction Programs, HQ AWS,
Scott AFB IL, 1993-94

OIC, Operating Location H, 7th Weather Squadron,
Schwaebisch Gmuend Army Installation, GE, 1988-91

Chief, Special Projects Production Section, HQ AFGWC, Offutt AFB NE, 1987-88

OIC, Computer Ops Team, HQ AFGWC, Offutt AFB NE, 1985-87



Major Martino is an Air Force Weather officer with experience in both Air Force and Army operational and staff support. His recent deployment experience includes Third US Army's Exercise Bright Star and Coalition Joint Task Force - Kuwait Operations Desert Thunder and Desert Fox. His graduate research thesis used dual-Doppler radar data collected during the 1987 Taiwan Area Mesoscale Experiment to determine thermodynamic budgets within a flood-producing, convective rainband. He is course director for EV389H (Meteorology and Air Pollution) and also teaches EV203 (Physical Geography).

MAJ MARK R. READ

Instructor, Geography

M.S., The Pennsylvania State University, 2002

B.S., USMA, West Point, 1992

Commander, A/1-4th Infantry, CMTC/Hohenfels, Germany,
1999-2000

Assistant S-3, 1-4th Infantry, CMTC/Hohenfels, Germany,
1998-1999

Infantry Operations Officer, Grafenwoehr Training Area,
Germany, 1997-1998

Executive Officer, E/3^d Infantry (The Old Guard), Ft. Meyer, VA, 1995-1996

Rifle Plt Ldr, C/3^d Infantry (The Old Guard), Ft. Meyer, VA, 1995

Support Plt Ldr, 3/2^d Armored Cavalry Regiment, Ft. Polk, LA, 1994-1995

Scout Plt Ldr, K/3/2^d Armored Cavalry Regiment, Ft. Polk, LA, 1993-1994



MAJ Read is an infantry officer who has served in leadership positions in the United States and Europe. He has participated in numerous rotations at the Joint Readiness Training Center (JRTC) and the Combat Maneuver Training Center (CMTC). MAJ Read's academic interests include physical geography, climatology, and military geography. His graduate work focused on the influence of atmospheric teleconnections on climate and streamflow in the Chesapeake Bay Watershed. MAJ Read is course director for EV388B (Geomorphology) and EV389B (Climatology). He also teaches EV203 (Physical Geography). MAJ Read is the Officer-In-Charge of the USMA Orienteering Team.

MAJ JEFFREY A. STARKE

Assistant Professor, Environmental Engineering

M.S.E.E, University of Wisconsin - Madison, 2001

B.S.C.E, Villanova University, 1991

EIT, Pennsylvania, 1991

Commander, HHB/3-43 PATRIOT ADA, FT Bliss, TX, 98-99

S-2, 3-43 PATRIOT ADA BN, FT Bliss, TX, 1997

Battalion Adjutant, 2-505 PIR (ABN), FT Bragg, NC, 1995-96

Executive Officer, D/2-505 PIR (ABN), FT Bragg, NC, 1995

Platoon Leader, 5/D/2-505 PIR (ABN), FT Bragg, NC, 94-95

Platoon Leader, 2/B/2-505 PIR (ABN), FT Bragg, NC, 1993-94



MAJ Starke served as an Infantry officer in the 82nd Airborne Division, and a Military Intelligence officer at Fort Bliss in an Echelon Above Corps (EAC) PATRIOT Air Defense Battalion. He participated in several deployments including JTF-6, Operation Safe Haven (Panama), Operation Desert Thunder (Kuwait), and Operation Desert Fox (Kuwait). He has deployed to the National Training Center (NTC) and the Joint Readiness Training Center (JRTC). MAJ Starke is an environmental engineer interested in water treatment and air pollution control. He has a Masters Degree in Environmental Engineering, and his thesis is titled "Inactivation of Cryptosporidium parvum in Natural Waters Using Free Chlorine." MAJ Starke is course director for EV401 (Physical and Chemical Processes) and also teaches EV300/EV390A (Environmental Science), EV301 (Environmental Science for Engineers and Scientists), and EV481 (Water Resources Planning and Design).

MAJ THOMAS C. TIMMES

Instructor, Environmental Engineering

M.S.E., Johns Hopkins University, 2000

B.S., Virginia Military Institute, 1992

Professional Engineer, Maryland, 2000

Chief, Field Water, U.S. Army Center for Health Promotion and Preventive Medicine, APG, MD 2001-2003

Company Commander, U.S. Army Chemical Activity-Pacific, Johnston Atoll, 2001

Medical Operations Officer, Johnston Atoll 2000

Environmental Science Officer, 82d Airborne Division 1996-98

Environmental Engineer, Fort Meade, MD 1994-1996

Sanitary Engineer, U.S. Army Environmental Hygiene Agency, MD 1992-1994



MAJ Timmes is a professional engineer in the Medical Service Corps who has served in a variety of field and TDA assignments. He has deployed locations like Macedonia, Uzbekistan, and Kazakhstan to conduct extensive drinking water system characterizations and medical threat validations. MAJ Timmes has a Masters Degree in Environmental Engineering, specializing in water quality aspects of lead and copper corrosion control. His academic and research interests include military field drinking water, water treatment plant optimization, and water system vulnerability assessments. MAJ Timmes teaches EV203 (Physical Geography) and EV350 (Environmental Technologies).

CPT BRIAN P. BAILEY

Instructor, Geospatial Information Science

M.S. (Spatial Information Science and Engineering), University of Maine – Orono, 2003

B.S. (Biology), The College of William and Mary, 1994

Battalion S-3, 602nd Aviation Support Battalion (ASB), Camp Stanley, Korea, 2000-2001

Commander, HSC, 602nd ASB, Camp Stanley, Korea, 1999-2000

Asst. Brigade S-4, HQs 1st BDE, 2ID, Camp Casey, Korea, 1999

Battalion S-1, 615th ASB, 1st CAV Division, Ft Hood, TX 97-98

Company XO, A Co/27th Main Support Battalion, Ft Hood, TX 1997

Platoon Leader, B Co/1-9 CAV, Fort Hood, Texas, 1996-1997

Support Platoon Leader, 2-9IN (MANCHU), Camp Casey, Korea 1995-1996

Platoon Leader, D Co/5-20IN, Camp Casey, Korea, 1995

Fire Control Technician (FCSN), USS Hermitage, Norfolk, Virginia 1987-1989



CPT Bailey enlisted in the United States Navy in 1987 as a Boatswain's Mate, and later became designated as a technician for the phalanx weapons system. After receiving his commission, CPT Bailey started as an infantry platoon leader in Korea and Fort Hood. Later, he transitioned to the Quartermaster Corps and returned to Korea to serve as a Company Commander and a Battalion Operations Officer. His academic interests are Geographic Information Systems with a focus on Content Based Image Retrieval (CBIR). CPT Bailey teaches EV203 (Physical Geography) and EV398 (Geographic Information Systems).

CPT BRIAN A. FORN

Instructor, Geography

M.A., University of California, Los Angeles, 2003

M.S., University of Missouri – Rolla, 1997

B.S., USMA, West Point, 1993

Company Commander, HSC, 52nd Engr Cbt Bn (Heavy), Fort Carson, CO, 2000-2001

S1, 52nd Engr Cbt Bn (Heavy), Fort Carson, CO, 1998-2000

Staff Engineer, Area III, Camp Humphreys, ROK, 1997-1998

Executive Officer, A Company, 14th Engr Bn (Corps)(Wheeled), Fort Lewis, WA, 1996

Battalion Support Platoon Leader, 14th Engr Bn (Corps)(Wheeled), Fort Lewis, WA, 1995

Platoon Leader, C Company, 14th Engr Bn (Corps)(Wheeled), Fort Lewis, WA, 1993-1994



CPT Forn is an Engineer officer who has served in both Wheeled and Combat Heavy Engineer units. His experiences include a rotation at the Joint Readiness Training Center (JRTC). CPT Forn commanded a combat heavy engineer company and executed construction missions in Colorado, Oregon, and South Dakota. He also served as the staff engineer for several installations in the Republic of Korea. CPT Forn is geographer particularly interested in the cultural and historical geography of Latin America. CPT Forn teaches EV203 (Physical Geography).

CPT MATHEW D. GUERRIE

Instructor, Environmental Engineering

ME, University of Florida, 2002
MS, University of Missouri-Rolla, 1997
BS, United States Military Academy, 1993
EIT, Virginia, 1997

Commander, HHC/9th Engineer Battalion, Germany 1998-2000
Assistant S3, 9th Engineer Battalion, Germany 1997-98
Executive Officer, C/44th Engineer Battalion, Korea 1995-96
Platoon Leader, 497th Engineer Company (Port Construction),
Fort Eustis, VA 1993-1995



CPT Guerrie has served as an Engineer officer in the 7th Transportation Group, the 2nd Infantry Division, and the 1st Infantry Division. He participated in several deployments including a platoon construction mission at the Jungle Operations Training Center (Fort Sherman, Panama), Operation Uphold Democracy (Haiti), and Operation Joint Guardian (Kosovo). He has also deployed to the Combat Maneuver Training Center (CMTC) in Hohenfels, Germany. CPT Guerrie is an environmental engineer interested in water and wastewater treatment, water resource management, and hydrology. He has Masters Degrees in Environmental Engineering and Engineering Management. He is course director for EV394 (Hydrogeology), EV488 (Solid and Hazardous Waste Treatment and Remediation), and also teaches EV203 (Physical Geography).

CPT ERIC D. LARKIN

Instructor, Geography

M.A., University of Hawaii, 2002
B.S., United States Military Academy, 1992

Team Trainer (AC/RC), C/1-174 IN, FT Drum, NY 1998-2000
Commander, C/1-503 IN (Aaslt) Camp Casey, ROK, 1997-98
Battalion Adjutant, UNCSB-JSA, Camp Bonifas, ROK, 96-97
Mortar Plt Ldr, HHC/1-509 IN (ABN), FT Polk, LA, 1995-96
Executive Officer, C/5-20 IN (M), Camp Casey, ROK, 1994
Platoon Leader, 2/C/5-20 IN (M), Camp Casey, ROK, 1993-94



CPT Larkin is an infantry officer with experience in mechanized, airborne, and air assault battalions. His most recent assignment was as a Company Team Chief in an Active Commission/Reserve Component (AC/RC) assignment. CPT Larkin is a physical geographer with academic and research interests in the effects of land cover change on the surface radiation balance and radiation balance modeling. CPT Larkin is course director for EV391A (Principles of Land Use and Management) and also teaches EV203, (Physical Geography).

CPT MICHAEL E. SENN

Instructor, Geography

MA, University of North Carolina–Chapel Hill, 2003

MS, University of Missouri-Rolla, 1998
BS, United States Military Academy, 1993

Commander, G Troop, 2/3 ACR, Fort Carson, CO, 1999-2001
Assistant S3, 2/3 ACR, Fort Carson, CO, 1999
Assistant S3 (Plans), 3 ACR, Fort Carson, CO, 1998-1999
Adjutant, 3/69 Armor, Fort Stewart, GA, 1995-1997
Executive Officer, D Company, 3/69 Armor, 1994-1995
Platoon Leader, D Company, 3/69 Armor, 1993-1994



CPT Senn is an Armor officer who has served in both Armor and Cavalry units. His experiences include deployments to Kuwait as a tank platoon leader and to Bosnia (SFOR 7) as a cavalry troop commander. He also has completed several rotations at the National Training Center (NTC) and one at the Joint Readiness Training Center (JRTC). CPT Senn holds master's degrees in Engineering Management and Geography. He is a physical geographer with interests in climatology and biogeography. His thesis was titled "A Synoptic Climatology of Southeast Spring Severe Weather, 1950-2000". CPT Senn teaches EV203 (Physical Geography).

CPT WILLIAM M. REDING

Instructor, Geography

M.S., University of Tennessee, 2002
B.S., Murray State University, 1993

Company Commander, HSC, 52nd Engr Cbt Bn (HVY), FT Carson, CO, 1998-2000
S-4, 52nd Engr Cbt Bn (HVY) Fort Carson, CO 1997-98
Executive Officer, A Co, 16th Engr Bn (Corps Mech) Bamberg, Germany, 1996-97
Assault & Obstacle Platoon Leader, A Co, 16th Engr Bn (Corps Mech) Bamberg, Germany 1995-96
Platoon Leader, A Co, 16th Engr Bn (Corps Mech) Bamberg, Germany, 1994-95



CPT Reding is an Engineer officer who has served in both Combat and Combat Heavy Engineer units. His experience includes rotations at the Combat Maneuver Training Center in Germany and deployments to Norway and Guatemala, as well as deploying to Bosnia and Herzegovina in support of Operation Joint Endeavor. CPT Reding is a human geographer interested in historical and cultural geography, particularly settlement patterns. He has a Masters degree in Geography and his thesis is titled, "Assessment of Spatial and Temporal Patterns of Log Structures in East Tennessee." CPT Reding is course director for EV373 (Geography of Latin America) and teaches EV365 (Cultural and Political Geography).

CPT MARK E. TALBOT

Instructor, Environmental Engineering

M.S.E.E., University of North Carolina at Chapel Hill, 2002
B.S., USMA, West Point, 1993

Commander, A/1-507th Parachute Infantry Regiment,
FT Benning, GA, 1998-2000

Platoon Trainer, C/4 Ranger Training Brigade, 1997-1998

Executive Officer, D/1-325 Airborne Infantry Regiment,
FT Bragg, NC, 1996-1997

Executive Officer, HHC/1-325 Airborne Infantry Regiment,
FT Bragg, NC, 1995-1996

Platoon Leader, 2/C/1-325 Airborne Infantry Regiment, FT Bragg, NC, 1993-1995



CPT Talbot is an Infantry officer and has served in various staff and leadership positions. His particular focus has been in Airborne operations, and he has participated in numerous rotations to the Army’s major training centers. CPT Talbot is an environmental engineer interested in drinking water treatment and quality as well as educating the public on environmental issues. He has a Masters degree in Environmental Engineering, and his thesis is entitled “Integrating inactivation kinetics, disinfectant decay and reactor hydraulics for evaluating disinfection effectiveness.” CPT Talbot is course director for EV350 (Environmental Technologies) and also teaches EV385B (Intro to Environmental Engineering) and EV390A (Environmental Science).



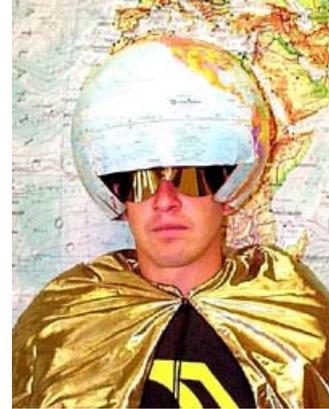
Geography faculty with cadets at the Australian Parliament in Canberra

EMERITUS FACULTY

DIRTMAN

Professor of Physical Geography and
The Spirit of the Department of G&EnE

- Ph.D., United States Military Academy, 1959
- M.S., United States Air Force Academy, 1959
(top graduate)
- M.S., United States Naval Academy, 1845
(top graduate)
- B.S., United States Military Academy, 1802 (goat)
- P.E., Commonwealth of Virginia, 1802



DIRTMAN is a retired Department faculty member currently residing on the rooftop of Washington Hall (near the Weather Station) and is known to spontaneously rally cadets enrolled in EV203, “Dirt”, to support Army athletic teams on the fields of friendly strife. As a former Army officer, he has served in every climatic regime known to man. He is an expert in geomorphology with special interest in plate tectonics. He is currently involved in advance studies of weather systems and enjoys the passage of wave cyclones and occluded fronts. He has personally experienced all known environmental hazards including tornadoes, hurricanes, earthquakes, tsunamis, volcanic eruptions, and williwaws. Of particular note, his volcanic encounter in 1980 in Washington State occurred shortly after he was subducted under the North American plate. As an emeritus faculty member, he is in charge of the morale and welfare of the Department faculty and all cadets in EV203.



Infamous DIRTMAN fires up the crowd at Army-Navy game send off



Department-led Army Orienteering Club members



Cadets scale to new heights in Colorado during the Environmental Science Field Geology Course

FIRST REGIMENT USCC–GEOGRAPHY & ENVIRONMENTAL ENGINEERING MAJORS

Company A1

04 EUBANKS, ELISE	Hum/Reg Geo
04 SCHUTTE, MATTHEW	GIS
04 SWANSON, HOWARD	Env Geo
04 THOMAS, JAY	Hum/Reg Geo
04 THOMPSON, MICHAEL	GIS
05 CURLEY, ANSLEY	GIS
05 KEEFER, ZACH	Env Eng
05 NUSSBAUMER, ROBERT	Hum/Reg Geo
05 RODRIGUEZ, SEBASTIAN	Hum/Reg Geo

Company B1

04 CROSSMAN, BRYAN	Hum/Reg Geo
04 DESAULNIERS, JAMES	GIS
05 ROBINSON, MATT	Env Eng
05 TAYLOR, ANDREW	Env Geo

Company C1

04 BAILEY, OMAR	Env Geo
04 CREVIER, MELANIE	Hum/Reg Geo
04 HOWALD, DAVID	Hum/Reg Geo
04 HURLEY, BRADEN	GIS
04 LEWIS, CHARLES	Hum/Reg Geo
04 MCNICOL, SHAWN	Env Geo
04 SCOTT, NATHAN	GIS
05 LUVERA, NICOLE	Hum/Reg Geo

Company D1

04 OSBORNE, JONATHAN	Env Geo
04 SPARKS, PRESTON	Hum/Reg Geo
04 WOLLSCHLAGER, MARY	Env Sci
05 ARDOHAIN, CHRIS	GIS
05 CHAPMAN, ALICIA	GIS

Company H1

04 COLONNA, LAUREN	Env Sci
04 FITZPATRICK, BRYAN	GIS
04 SALFEETY, PETER	Hum/Reg Geo

Company E1

04 BARNEY, JADE	Env Geo
04 CHUNG, GRACE	GIS
04 MITCHELL, COLIN	GIS
04 NOBLE, ROBERT	Hum/Reg Geo
04 REVELS, ROBERT	Hum/Reg Geo
04 WRIGHT,ERIK	Env Geo
05 BREWSTER, KERRY	Env Sci
05 COUCH, CHRIS	Hum/Reg Geo
05 FASTOW, RAMONA	Hum/Reg Geo
05 ISGRO, DOMINIC	Hum/Reg Geo

Company F1

04 DAVIS, KRISTIN	Hum/Reg Geo
04 FABER, MICHAEL	GIS
04 FIERNER, DAVID	GIS
04 IRELAND, JAY	Hum/Reg Geo
04 MARKS, TRAVIS	Env Geo
04 SMITH, SEAN	Hum/Reg Geo
04 TSUCHIYA, REBECCA	Hum/Reg Geo
05 ANDERSON, JAMES	GIS
05 KELLEY, SHANNON	Env Sci
05 MEYER, JOSEPH	Hum/Reg Geo
05 NIEMAN, SETH	Hum/Reg Geo
05 PARK, CARUSOE	Env Sci
05 PERRY, CHRIS	Env Sci
05 SMITH, CHRIS	GIS

Company G1

04 HSIA, TIMOTHY	Env Eng
05 HAITH, MATTHEW	Env Eng
05 MARTIN, TIFFANY	Hum/Reg Geo
05 SWARTZLANDER, JANEEN	Env Sci

Company H1

05 PIERCE, RICHARD	Env Eng
05 WEBBER, ANDREW	Hum/Reg Geo
05 ZGONC, DAVID	Env Eng



Cadets at the Dome of the Rock during Israel AIAD

SECOND REGIMENT USCC–GEOGRAPHY & ENVIRONMENTAL ENGINEERING MAJORS

Company A2

04 KELLEY, SHANNON	Env Geo
04 NORMAND, MICHAEL	GIS
04 SIEGERT, EMILY	Env Eng
05 ABDOU, AMEN	GIS
05 CHON, HYUN-SU	Hum/Reg Geo
05 SMITH, WADE	Env Eng
	Env Geo

Company B2

04 GARNER, RYAN	GIS
05 PLITSCH, JOHN	Env Eng
05 PYLE, NOAH	GIS
05 RUDBERG, ERIC	Env Eng
05 TATUM, CHERISE	Env Sci

Company C2

04 MCANULTY, JENILEE	GIS
04 ROBERTS, THOMAS	Hum/Reg Geo
04 STEWART, PETER	Env Geo
05 HINCHMAN, ROBERT	Hum/Reg Geo

Company D2

04 BOOTH, JASON	Hum/Reg Geo
04 DISHONG, CHRIS	GIS
04 SEEFELDT, ALEXIS	Env Sci
04 LOSNER, BRAD	GIS
05 KERN-RUESINK, ELIJAH	Hum/Reg Geo
05 MUSGRAVE, DAVID	Hum/Reg Geo

Company E2

04 EBERLE, WILL	Hum/Reg Geo
04 KAYE, ZACHARY	Hum/Reg Geo

Company F2

04 BRICE, PATRICK	GIS
04 DOUGHERTY, BRYAN	Hum/Reg Geo
04 FLOER, RICHARD	Env Geo
04 PALADINO, MATTHEW	Env Eng
04 RICKE, DEREK	GIS
05 ALIX, DANIEL	Hum/Reg Geo
05 TEPLEY, THOMAS	Hum/Reg Geo
05 WOOD, ALAN	Hum/Reg Geo

Company G2

04 BARTOLOTTA, DOUG	Hum/Reg Geo
04 MORENO, DARON	Env Eng
04 ORLANDINI, JORGE	Env Sci
04 WILEY, SHAWN	GIS
05 CARLIN, GRETCHEN	Env Geo
05 WEBB, GEORGE	Hum/Reg Geo

Company H2

04 BOCK, AMOS	GIS
04 BOJARSKI, ADAM	Hum/Reg Geo
04 GALVACH, ZANE	Hum/Reg Geo
04 HURLEY, ELLISA	Env Eng
04 MACHON, CAITLIN	Hum/Reg Geo
04 MOSS, WILLIAM	GIS
04 POWELL, OWEN	Hum/Reg Geo
04 REASS, SHAUN	Hum/Reg Geo
04 WELTE, SIMON	GIS
05 BRIGHT, DEVIN	Env Sci
05 LOWRY, CURTIS	Env Eng

Company E2

05 DEVONSHIRE, KAT	GIS
05 HEALY, SEAN	Env Eng
05 KING, MATTHEW	Env Eng
05 MINGES, EDWIN	Env Geo



Cadets interacting with Mt Fuji Station 7 workers during SE Asia AIAD

THIRD REGIMENT USCC–GEOGRAPHY & ENVIRONMENTAL ENGINEERING MAJORS

Company A3

04 ROBISON, CECIL Env Geo

Company B3

04 SALGADO, JOSEPH Env Geo
05 ALEXANDER, AARON Hum/Reg Geo

Company C3

04 BROWN, CALEB GIS
04 LEIBOVICH, DAVID Env Eng
05 RUDZINSKYJ, BOHDAN Env Geo
05 VANBEMDEN, GREG GIS

Company D3

04 DUNCAN, CHRIS Env Geo
04 MCKINNON, MOLLY Hum/Reg Geo
05 KING, AARON Hum/Reg Geo
05 PATTON, SEAN Hum/Reg Geo
05 POWLEDGE, RUSSELL Hum/Reg Geo

Company E3

05 ELLEMENT, MATTHEW Env Sci
05 HENSON, PATRICK Env Eng

Company F3

04 DEERING, ANDY Env Geo

Company G3

04 LAUDICK, KRISTY GIS
04 WALKER, ADRIAN GIS
05 BUFFINGTON, WILLIAM Env Geo
05 SIMPSON, PHILLIP Hum/Reg Geo
05 WEGNER, JUSTIN GIS

Company H3

04 DESANTIAGO, JUAN Hum/Reg Geo
04 HOWRY, RYAN Hum/Reg Geo
04 KUMAGAI, HITOSHI Hum/Reg Geo
04 MCCORMACK, JOHN GIS
04 MCMEANS, BRIAN GIS
05 BREWER, CRAIG Hum/Reg Geo
05 HUNTINGTON, LISA Env Eng



Cadet takes field data to the Environmental laboratory during his Advanced Independent Study project

FOURTH REGIMENT USCC–GEOGRAPHY & ENVIRONMENTAL ENGINEERING MAJORS

Company A4

04 BLAIR, JENNIFER	Hum/Reg Geo
04 BOSSE, BRIAN	GIS
04 HOPPER, TREVOR	Env Eng
04 LAGER, ERICA	Hum/Reg Geo
04 NEUMANN, JASON	Hum/Reg Geo
04 PERRIN, KRISTOPHER	Hum/Reg Geo
05 BREEN, SEAN	GIS
05 MCKAY, JAMES	Env Sci
05 MONROE, CHAD	Hum/Reg Geo

Company E4

04 MARULLO, JOSEPH	Env Eng
04 WILD, SHAUN	GIS
05 FARRANT, TIANA	GIS
05 MONTAGLIANI, CHRIS	Env Geo
05 OKTAVEC, MIKE	Env Sci
05 STRIPLING, BAILEY	Hum/Reg Geo
05 WOLFE, MASSEY	Env Geo

Company B4

04 BIGGER, LORI	Hum/Reg Geo
04 COOKE, MICHAEL	Env Eng
04 DEVINE, TIMOTHY	Env Eng
04 GRIGGS, RANDALL	GIS
04 TERRY, TIA	Env Sci
05 ALVES, ALEJANDRO	Hum/Reg Geo
05 SCARDINA, HAYDEN	GIS

Company F4

04 CLARK, FRANCES	Hum/Reg Geo
04 COLBY, SAMUEL	Hum/Reg Geo
05 HARTFELDER, GREG	Hum/Reg Geo
05 WOOD, NICHOLAS	GIS

Company G4

04 ALVAREZ, PAULINA	GIS
04 CATTLEY, CHRISTINA	Env Sci
04 HOLBROOK, JASON	Env Sci
04 KELLEY, JESSE	GIS
04 LOUDON, NICHOLAS	Hum/Reg Geo
04 ROCKWELL, ANDREW	Hum/Reg Geo
04 SOMSSICH, JON	GIS
05 BARRATT, SIMON	Hum/Reg Geo
05 BRUCE, KATIE	Env Sci
05 FAGAN, JUSTIN	Env Geo
05 HACKER, ANDREW	GIS
05 KELTS, GREG	Env Sci
05 LYNCH, ADAM	Hum/Reg Geo
05 PHOMMASITH, TOM	GIS
05 YOUNG, BENJAMIN	Env Sci
05 ZIELINSKI, WILLIAM	GIS

Company C4

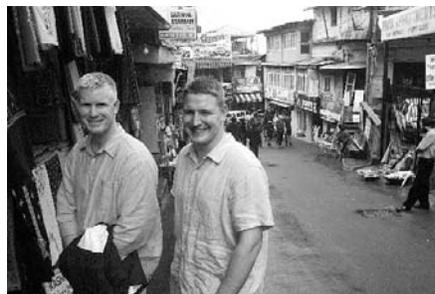
04 ALAILIMA, BIRDSALL	Hum/Reg Geo
04 BANDI, MATTHEW	Hum/Reg Geo
04 CHAPMAN, MARCELLUS	Hum/Reg Geo
04 LACAILLE, EMILY	Env Geo
04 SABIA, JOHN	GIS
04 SHANNON, GARRETT	Hum/Reg Geo
05 DAVIS, KELLY	GIS

Company D4

04 BET, ADAM	Hum/Reg Geo
04 FIELDS, SARA	Env Eng
04 JAMES, VERNON	Hum/Reg Geo
04 SKIDMORE, JOHN	GIS
05 GRIMM, STEPHANIE	GIS
05 HOWARD, JOSHUA	Env Eng
05 MEEHAN, AARON	GIS
05 PRESTON, GARY	GIS

Company H4

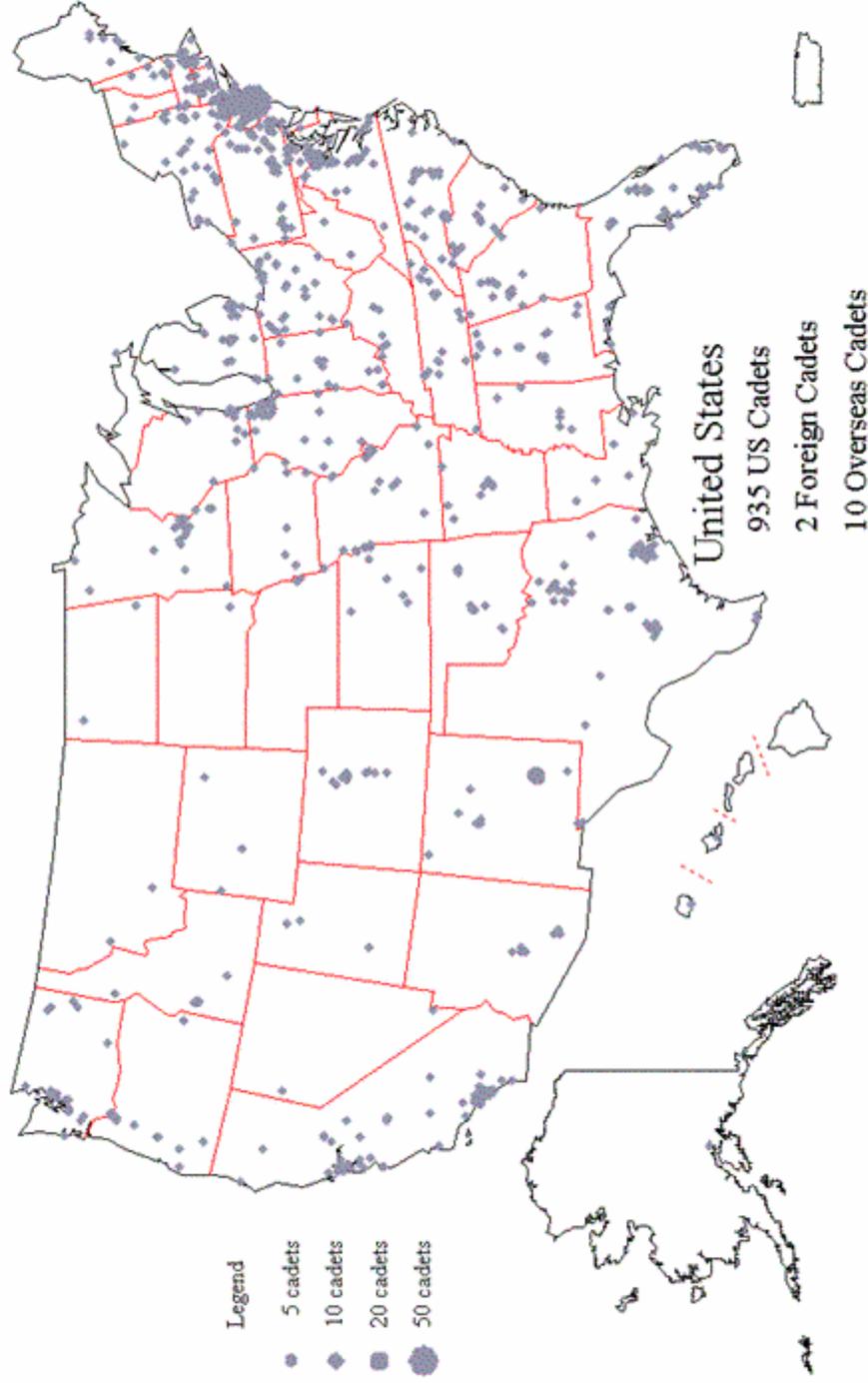
05 HERNANDEZ, ANTHEA	Hum/Reg Geo
05 MARMION, WILLIAM	Hum/Reg Geo
05 VON PLINSKY, ALLEN	GIS



Cadets experience urban life in India

The United States Military Academy, West Point, New York

Class of 2006 Hometown Map - "Never Falter Never Quit, '06"



Created by COL Scott A. Loomer, Geographic Sciences Laboratory

Data from the Office of the Dean prepared by MAJ Curtis B. Eddon



Department of Geography and Environmental Engineering



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