

**Department Catalog and
Guide to Academic Programs
CLASS OF 2008**



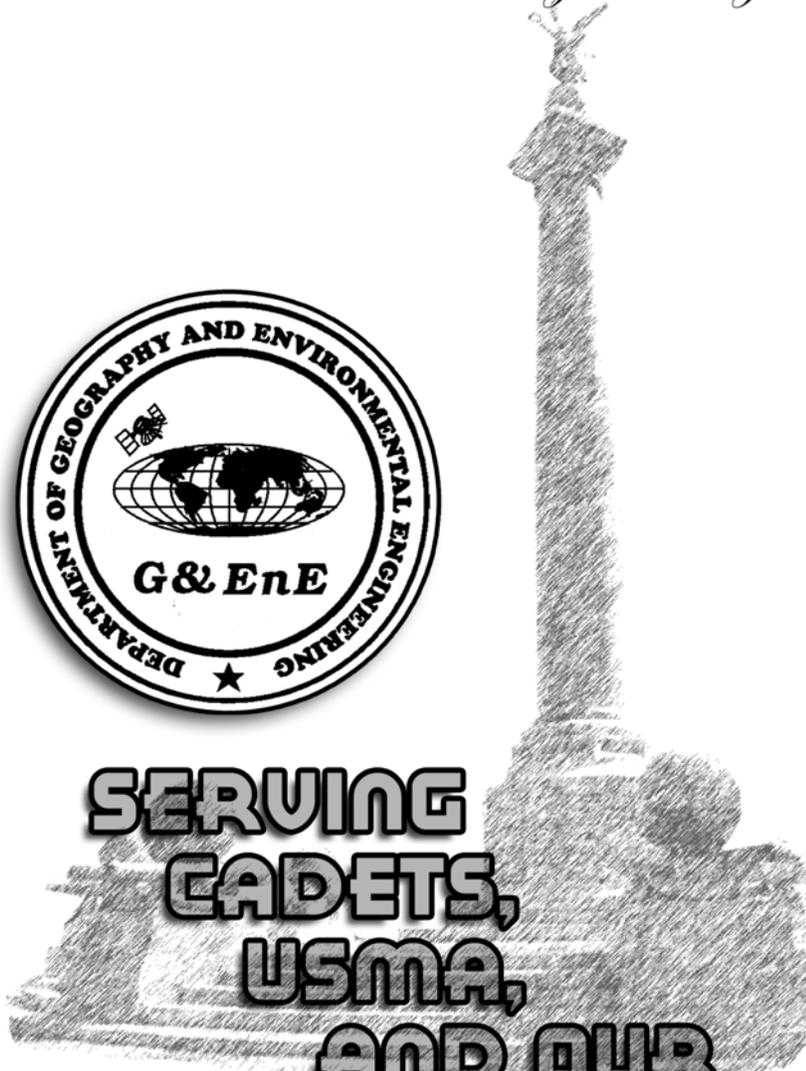
**Department of Geography and
Environmental Engineering**

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United States Military Academy

*Department of Geography and
Environmental Engineering*



**SERVING
CADETS,
USMA,
AND OUR
NATION**



DEPARTMENT CATALOG AND GUIDE TO ACADEMIC PROGRAMS

FOR THE CLASS OF 2008



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

The Department's overarching theme is to better understand the world in which we live. We offer a diverse group of majors and honors programs, which prepare cadets for service in the Army and encourage a lifetime of intellectual growth. These include:

1. Human Geography: the study of people, places, and how they interact.
2. Environmental Geography: the study of the interactions between people and the natural environment.
3. Environmental Science: an integrative study of processes that shape the environment and how human activity affects and is affected by these processes.
4. Environmental Engineering: the study of engineered processes to solve environmental problems to protect human health and preserve the fragile environment in which we live.
5. Geospatial Information Science: the integration and analysis of satellite, GPS, and map intelligence information.

Our majors and honors programs will prepare cadets 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 the following:

- ★ Understanding weather and terrain will always be the keys to victory in battle.
- ★ Understanding other people is necessary to preserve peace.
- ★ Understanding our Earth is critical for our future health and well-being.

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 our exciting majors, honors programs, and environmental engineering sequence. Our mission is the same as every academic department at West Point, to prepare cadets for a career in the Army and a lifetime of service to the Nation. Each course has the objective of developing you as a self-learner, problem solver, and critical thinker; all of which are attributes critical for success as a leader in the Army. In selecting a major, 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. Your task in selecting a major is to find that subject which excites you and inspires a vision for your future. We have much to offer—Let me tell you more!

Geography programs are alive and well in more than 250 universities across the nation. Geography is an exciting discipline with great variety and tremendous relevance for the military officer. Our program at West Point teaches cadets about the Earth, its people, and how they interact. We offer studies focused on the diverse peoples of the Earth. Our **Human Geography** major examines the spatial differentiation and organization of human activity and how people adapt to their surroundings. Majoring in **Environmental Geography** program enables the student to understand of the processes - natural and human - that form and change the Earth and how people interact with the natural environment. We use the Army as our laboratory to demonstrate how geography is used to accomplish military missions across the spectrum from peacetime to war. Geography majors have opportunities for advanced studies that literally take cadets around the world.

Super heroes go out to save the world-- Majoring in **Environmental Science** or **Environmental Engineering** may be your chance. The impact of over 6 billion people on the sustainability of the Earth is now visible everywhere, from the air we breath to the water we drink. We are going to have to find ways to co-exist with our natural environment and that is what you learn in the Environmental Engineering and Environmental Science majors. The Environmental Science majors develop an understanding of the physical, chemical and biological processes that govern the Earth's activities. Cadets can choose to study in depth any of the ecological processes or can study the management methods we use to manage and protect the environment. Environmental Engineers develop the skills needed to control human pollution of the air, land, and water. The program is an ABET approved engineering program which prepares you to clean and sustain the environment, protecting all of us from the adverse impacts of human activity. Over the past 3 years 100% of our environmental engineers have passed their initial licensing exam and been certified as Engineers in Training, the first important step in becoming a licensed professional engineer.

In our **Geospatial Information Science** program, you learn to analyze, describe, and visualize the features of the Earth in very remarkable 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 areas. Army applications of this technology for analyzing the battlefield are obvious, but there is much more ongoing in this field. If you have interest in this area, visit the instructors and let them tell you about this area of study.

Regardless of your major, the **Environmental Engineering Sequence** will enhance your West Point experience. This sequence accomplishes two goals in preparing you as an educated leader. First, it develops your ability to solve complex problems by introducing you to a decision-making process as applied to current environmental issues. Second, the sequence provides an understanding of the key environmental issues threatening the well-being of the world today, such as safe and sufficient water for a growing world population, clean air and global atmospheric protection, and the management of 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 booklet, consider what interests you, and then visit with our faculty, who are anxious to assist you in understanding the rewarding opportunities that are available within our department. ★

WENDELL C. KING
Colonel, PUSMA
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 the Federal Emergency Management Agency (FEMA) AIAD.

GEOGRAPHY AND ENVIRONMENTAL ENGINEERING AFTER GRADUATION

Each of our majors is focused on preparing you for success as a leader. Successful leaders are incisive thinkers who critically evaluate and solve problems. Regardless of your major, you will develop analytical problem solving skills in our classes that will serve you well in the future. Many of the problems you will face in the Army will be examined in our classes because the Army is our laboratory and we study real world examples. You will also become a capable user of some of the most up-to-date technology in your field. The department has the best undergraduate laboratory facilities in the country, and our Geospatial Sciences Laboratory is world-class. Thus, you will learn to understand the world around you, and be prepared to solve its most complex environmental problems. Our AIAD programs will provide you with an opportunity to see how the Army uses your discipline through assignments to Army and DoD activities throughout the world.

Majoring in this department does not limit your branch opportunities – on the contrary, it expands your value in whatever branch you choose. Each branch needs leaders that understand the world, its people, and how they interact – our programs will give you those skills. All Army units must train and operate in varied operational environments and within the guidelines of established environmental regulations in a way that sustains limited training lands. Finally, the special skills learned as part of the geospatial sciences program are critical to all types of military planning and provide the critical spatial data that every Army deployment requires. ★

- What Geographers and Environmental Engineers do for the Army

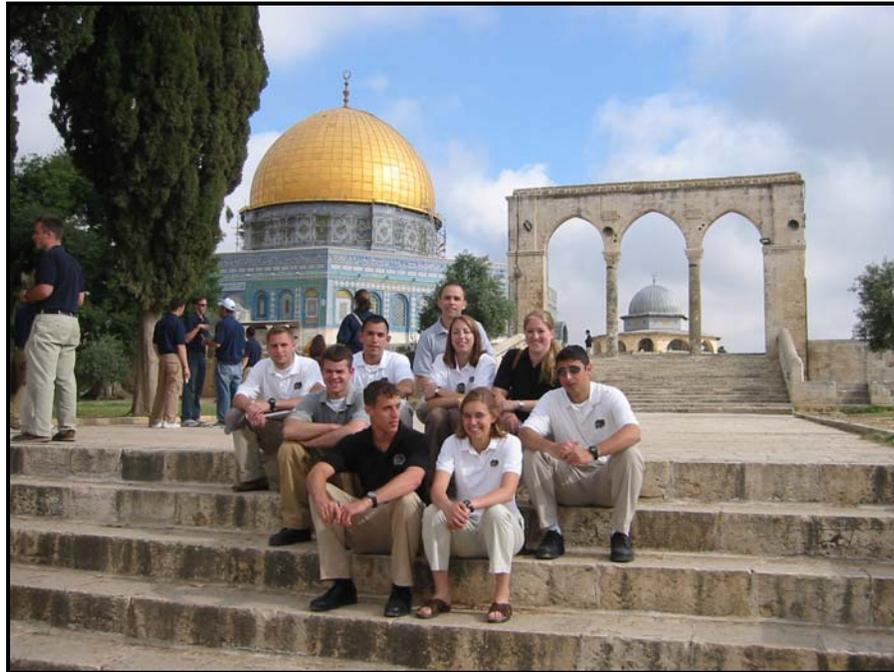
As a geographer or environmental engineer, you will be an asset to any branch or functional area. Your keen understanding of culture, technology, and engineering will provide you valuable insights for any mission. As our Army continues to place increased emphasis on cultural awareness and environmental issues, you will be well positioned to succeed regardless of your branch. Here are just a few examples:

WARFIGHTING: Geographers and environmental engineers are found in all combat and support branches. Terrain, weather, climate, and cultural landscapes are typically the decisive geographic elements common to every tactical environment and across the spectrum of Army missions. An understanding of physical geography enables the officer to judge the influence of climate, soils, vegetation, and terrain on military operations. A clear awareness of the fundamentals of cultural geography is a critical element in operational planning, given the high probabilities of low and mid-intensity conflict. Officers trained in the geospatial information sciences permit the Army to retain an advantage in maintaining information dominance on the battlefield. Environmental engineers and scientists are well suited to understanding and addressing environmental issues associated with warfare ranging between the use of environmental warfare by our adversaries to the protection of our troops from disease and other wartime environmental hazards.

OPERATIONS OTHER THAN WAR: As the Army's mission profile increasingly moves to stability and support operations, the need for well-trained geographers and environmental engineers will become critical. Today's peacekeeping and humanitarian support missions occur around the world. Likewise, humanitarian assistance has been provided in places such as Haiti, Zaire, Rwanda and Sudan. These examples reflect the diverse array of culture

systems and physical environments with which our soldiers must contend. Officers trained in human geography understand cultural, political, and economic situations and are a valuable asset to every peacekeeping mission. Environmental geographers can assess the natural landscape, environmental resources, and human-environment interaction, thus providing useful information during peacekeeping or disaster relief operations. The environmental 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. Finally, all Army units rely on geospatial information.

SUPPORTING MILITARY TRAINING: During peacetime operations, leaders are increasingly challenged to develop imaginative ways in which to provide tough, realistic training while sustaining and improving the condition of our training areas. In preparing for the unit's wartime mission, a geographer's understanding of contingency locations around the world is useful in developing realistic training conditions. Environmental scientists and engineers implement policies 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.



Department cadets at the Temple Mount in Jerusalem during the 2005 AIAD.

GEOGRAPHY AND ENVIRONMENTAL ENGINEERING AT WEST POINT

- General

The Department offers some 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, regardless of the program, 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 theme permeates all aspects of the academic program.

- Opportunities for Geography and Environmental Engineering Concentrators:

DEPARTMENT ACTIVITIES AND FACILITIES. Our majors 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. Cadets have the opportunity to work with agencies such as the Army Environmental Center, Army Environmental Policy Institute, Topographic Engineer Center, National Imagery and Mapping Agency, Army Research Institute, Environmental Protection Agency, and 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.

INDIVIDUAL RESEARCH. Each semester a number of cadets are selected to participate in individually designed research and study programs on topics of special interest. Cadets and a faculty sponsor typically design projects jointly. Research opportunities such as these offer a unique opportunity to excel in an area of academic interest. Examples of recent projects include a base camp suitability model for Croatia using GIS, a study of lead contamination in the Lake Popolopen watershed, Iona Marsh study, storm water filter effectiveness study at the West Point Exchange, an examination of the proposed nuclear waste disposal site at Yucca Mountain, Nevada, and an evaluation of beach erosion hot-spots along the mid-Atlantic coast.

HONORS PROGRAMS. Four of the Department's six majors offers an Honors Program for qualified cadets. The GIS and Geography honors programs begin during term seven and participants attend a research seminar. During this seminar, cadets explore salient research issues in their particular field, research methodologies and develop technical writing skills. As part of this seminar, each cadet will define a research topic, explore the literature, and develop a research proposal. During their final term, cadets will use the research proposal as a point-of-departure and conduct an independent study project. At the end of the year, the cadet will present his/her findings to the faculty and submit a written research report.

Environmental Science and Environmental Engineering majors will complete an independent research project (EV489A) during term 7 or 8 and present their findings to their classmates and faculty. Refer to the detailed program descriptions in this book and see your academic counselor for the specific details for each Honors Program as well as entry standards.

ACADEMIC AWARDS. The Department recognizes its best cadets using a number of prestigious 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 presented at the annual Graduation Awards Convocation to the cadet in each respective major with the highest grade point average in the elective program.



Department Cadets with Israeli soldiers at the beach in Tel Aviv.

Academic Awards - Previous Awardees

- Congressional Medal of Honor Society Award for Excellence in Geography

05 - Kristin Davis	98 - Michael Lipsner
04 - Charles Lewis	97 - Aaron Ecklund
03 - Thomas Lainis	96 - Brian Gavula
02 - Eric Wilkinson	95 - Mark Walters
01 - Matthew Sullivan	94 - Kevin Kercher
00 - Joshua Schneider	93 - Michael Senn
99 - Matthew Debiec	

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

05 - Sean Healy	98 - Bradley Stoltz
04 - Joe Marullo	97 - Ralph Radka
03 - Sarah Williams	96 - David Hemke
02 - Stephen Lewandowski	95 - David Phillips
01 - Paul McBride	94 - Brett Sylvia
00 - Jeffery Jager	93 - William Chess
99 - Travis Rayfield	

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

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

- Environmental Systems Research Institute award for excellence in Geospatial Information Science

05 - William Zielinski	01 - Ryan Piotrowski
04 - Grace Chung	00 - Joshua Schneider
03 - Jeffrey Oster	
02 - Miguel Gastellum	



GEOGRAPHY & ENVIRONMENTAL ENGINEERING PROGRAMS: CLASS OF 2008

SCOPE: Our Geography, Environmental, and Geospatial Information Science programs are designed to prepare cadets for careers involving the observation, evaluation and design of human and physical systems in today's interdependent world. State of the art departmental laboratory facilities support our programs.

OPTIONS: Students desiring to complete a baseline program have six alternatives for a major. Those who desire academic enrichment in the discipline and meet academic requirements may apply to participate in an honors program in any of our six majors. The program areas are:

- ★ Human Geography
- ★ Environmental Geography
- ★ Environmental Science
- ★ Environmental Engineering
- ★ Environmental Engineering Studies
- ★ Geospatial Information Science

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

ENGINEERING SEQUENCE: The **3-Course Environmental Engineering Sequence** is available to all cadets. It furnishes an engineering sequence that focuses on important environmental issues and provides cadets with the opportunity to develop viable, sustainable solutions. It offers an opportunity to learn and apply the engineering design process in the natural world, within which social, political, cultural, and economic considerations are critical factors in decision-making. The environmental engineering sequence has three important objectives:

- ★ Have cadets attain a fundamental appreciation of the most salient environmental issues and an understanding of their underlying causes and impacts on the natural environment.
- ★ Provide cadets with the ability to formulate and communicate practical engineering solutions to important environmental problems.
- ★ Teach cadets to develop and apply viable engineering solutions that conform to important economic, social, cultural, and political criteria.

The first course in the sequence, **EV300 (Environmental Science)**, provides cadets with a broad understanding of what the term "environmental issues" encompasses and how humans are negatively affecting the biosphere. The second course, **EV350 (Environmental Technologies)**, builds on the EV300 experience through the application of science-based engineered solutions to common environmental issues. Finally, in **EV450 (Environmental Decision Making)** cadets learn to balance engineered solutions with economic, social, political, and ecological considerations. Using many aspects of water resources, such as hydropower, navigation, drinking water supply, fish habitat, recreation, as a teaching model, cadets learn decision-making and policy development realities. ★

PROGRAM DESCRIPTIONS

- GEOGRAPHY:

Geographers examine the spatial arrangements, processes, distributions, and organization of natural and human landscapes. Geography is a broad, integrating discipline with methodologies and analytical foundations that span engineering, science, and the humanities. Majoring in geography requires persistent curiosity and inquiry into human-land-environment interfaces: how natural systems function; how physical landscapes evolve; how human populations adapt; and how humans shape the environment. Two majors allow cadets to explore geography either from a natural or social science perspective. The Environmental Geography program emphasizes the study of the natural landscape, anthropogenic influences on the environment, and natural hazards. The Human 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 such as computer cartography, remote sensing, and geographic information systems. Geography is the ideal discipline for an Army officer expected to lead soldiers in a changing world. ★



Main Points of Contact:

Human Geography: Dr. Jon Malinowski, W5352, x4673, email: bj0264

Environmental Geography: Dr. Amy Richmond, W5412, x3735,
email: ba5081

- ENVIRONMENTAL SCIENCE:

The relationship between modern society and the Earth is controlled by pressures created by technological development and population growth. This program develops an understanding of processes that govern the Earth's environment by expanding upon the USMA core science education and adding studies in biology, geology, and climatology. This broad academic background is excellent preparation for challenges faced by a military leader who must balance resource and human requirements. The program has two desired outcomes: (1) impart an understanding of ecosystem responses to human interaction; and (2) impart an understanding of environmental degradation and how to combat it. Both outcomes are critical in developing responsible environmental stewardship. ★



Main Point of Contact: Dr. Marie Johnson, W5416, x4855, email: bm6894

• ENVIRONMENTAL ENGINEERING:

Environmental engineers design systems that protect human health, clean up contamination from the past, and sustain natural processes. Consequently, environmental engineers examine natural processes that control the environment and the impact of human activities on those environments. They also design engineered solutions to solve a variety of complex environmental problems. Our Environmental Engineering program investigates 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 program is fully sanctioned by the Accreditation Board of Engineering and Technology (ABET) and represents an opportunity to complete the first step in professional engineering licensure — the Fundamentals of Engineering Exam (FEE), which is offered prior to graduation. ★



Main Point of Contact: Dr. Mike Butkus, W5317, x2820, 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. 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, W5302, x2063, email: bj9296

**GEOGRAPHY AND ENVIRONMENTAL ENGINEERING
FACULTY COUNSELORS FOR AY 05-06**

<u>PROGRAM</u>	<u>FIELD COUNSELOR</u>	<u>OFFICE</u>	<u>PHONE</u>
Geography and Foreign Area Studies	LTC Galgano	W5304	4035
Environmental Engineering and Science	COL Manous	W5324	2930
Geospatial Information Science	Dr. Brockhaus	W5302	2063
Counseling and Scheduling	MAJ Forn	W5321	3540

COURSE DIRECTORS

<u>COURSE</u>	<u>TITLE</u>	<u>COURSE DIRECTOR</u>	<u>OFFICE</u>	<u>PHONE</u>
EV203	Physical Geography	LTC Gilewitch	W5411	4400
EV300	Environmental Science	LTC Houston	W5415	3938
EV301	Environmental Science for Engineers and Scientists	Dr. Johnson	W5416	4855
EV303	Foundations in Geography	Dr. Malinowski	W5323	4673
EV350	Environmental Technologies	MAJ Timmes	W5318	4135
EV365	Geography of Global Cultures	LTC Dalton	W5311	3403
EV371	Geography of Russia	LTC Dalton	W5311	3403
EV372	Geography of Asia	Dr. Malinowski	W5323	4673
EV373	Geography of Latin America	MAJ Forn	W5321	3540
EV373	Geography of the Middle East and Africa	MAJ Doyle	W5400	5421
EV377	Remote Sensing	Dr. Brockhaus	W5302	2063
EV378	Cartography	CPT Oxendine	W5400	3253
EV379	Photogrammetry	CPT Oxendine	W5400	3253
EV380	Principles of Surveying	MAJ Bailey	W5414	4620
EV384	Geography of North America	MAJ Doyle	W5400	3042
EV385	Introduction to Environmental Engineering	LTC Houston	W5415	3938
EV386	Geography of Europe	LTC Dalton	W5311	3403
EV388A	Physical Geology	Dr. Johnson	W5413	4855
EV388B	Geomorphology	LTC Galgano	W5404	4035

<u>COURSE</u>	<u>TITLE</u>	<u>COURSE DIRECTOR</u>	<u>OFFICE</u>	<u>PHONE</u>
EV389B	Climatology	MAJ Senn	W5332	2679
EV390B	Urban Geography	MAJ Forn	W5321	3540
EV391A	Principles of Land Use Planning and Management	MAJ Peguero	W5332	3986
EV391B	Environmental Geology	Dr. Johnson	W5416	4855
EV394	Hydrogeology	LTC Lynch	W5320	5126
EV396	Environmental Biological Systems	MAJ Epolito	W6003	5421
EV397	Meteorology and Air Pollution	MAJ Dacunto	W5322	4622
EV398	Geographic Information Systems	LTC Hendricks	W5303B	4869
EV399A	Geology Field Course	LTC Houston	W5414	3938
EV401	Physical and Chemical Treatment	MAJ Timmes	W5318	4135
EV402	Biochemical Treatment	MAJ Timmes	W5318	4135
EV450	Environmental Decision Making	MAJ Dacunto	W5322	4622
EV471	Ecology	LTC Houston	W5415	3938
EV477	Advanced Remote Sensing	Dr. Brockhaus	W5302	2063
EV480	Honors Seminar in Geography	LTC Galgano	W5304	4035
EV481	Water Resources Planning and Design	COL Manous	W5324	2930
EV482	Military Geography	LTC Galgano	W5304	4035
EV483	Colloquium In Geography	Dr. Malinowski	W5323	4673
EV485	Special Topics in Geography and the Environment	TBA		
EV486	Environmental Geography	LTC Galgano	W5304	4035
EV487	Environmental Security	COL Manous	W5324	2930
EV488	Solid and Hazardous Waste Treatment and Remediation	LTC Lynch	W5320	5126
EV489A	Advanced Individual Study I	Assigned to individual cadets		
EV489B	Advanced Individual Study II	Assigned to individual cadets		
EV490	Advanced Environmental Process Design	COL Manous	W5324	2930

<u>COURSE</u>	<u>TITLE</u>	<u>COURSE DIRECTOR</u>	<u>OFFICE</u>	<u>PHONE</u>
EV498	Advanced Geographic Information Systems	LTC Hendricks	W5303B	4869
XS391	Principles and Applications of Environmental Chemistry	MAJ Epolito	W6003	5421



Cadet Nick Nussdorfer rides in the Karatau Mountains of Kazakhstan during the 2005 Central Asia AIAD.



Department cadets in the Rocky Mountains during the 2005 Geology Field Course.



CDT Jason Song takes aim while at the Indian Military Academy.

HUMAN GEOGRAPHY

HUMAN GEOGRAPHY MAJOR (GEO) HUMAN GEOGRAPHY MAJOR WITH HONORS (GEOH)

CORE CURRICULUM AND ENGINEERING SEQUENCE:

- 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
IT305	Theory and Practice of Military IT Systems
IT355	Advanced Theory and Practice of Military IT Systems

FOUNDATION COURSES:

- Complete the four (4) courses listed below:

Course #	Course Title
EV303	Foundations in Geography
EV365	Geography of Global Cultures
EV398	Geographic Information Systems
EV3XX	Any Regional Geography Course (1 of 6)

PHYSICAL GEOGRAPHY

- Complete one (1) of the courses listed below:

Course #	Course Title
EV388A	Physical Geology
EV388B	Geomorphology
EV389B	Climatology
EV391B	Environmental Geology

GEOGRAPHY TOOLS

- Complete one (1) of the courses listed below:

Course #	Course Title
EV377	Remote Sensing
EV378	Cartography
LX ____	Third Semester of Language
PL361	Research Methods
SS368	Econometrics
MA376	Applied Statistics

GEOGRAPHY ELECTIVE:

- Complete two (2) of three (3):

Course #	Course Title
EV390B	Urban Geography
EV391A	Land Use Planning and Management
EV3XX	Any Regional Geography Course (1 of 6)

GENERAL ELECTIVE:

- Complete one (1) course from the Human Geography Elective list

Course #	Course Title
EV371	Geography of Russia
EV372	Geography of Asia
EV373	Geography of Latin America
EV374	Geography of the Middle East and Africa
EV377	Remote Sensing
EV378	Cartography
EV384	Geography of North America
EV386	Geography of Europe
EV388B	Geomorphology
EV389B	Climatology
EV390B	Urban Geography
EV391A	Principles of Land Use Planning and Management
EV391B	Environmental Geology
EV397	Meteorology and Air Pollution
EV485	Special Topics in Geography and the Environment
EV489A	Advanced Individual Study in Geography
EP333	Cultural Studies
EP392	Ethnic Literature
HI360	History of the Classical World
HI361	History of the Medieval World
HI362	Politics and Society in Early Modern Europe
HI363	Europe in Transition/Revolution, 1648-1950
HI366	Diplomatic History of Europe
HI367	History of Imperial and Soviet Russia
HI371A	History of France in Modern Times, 1848-1968
HI371D	History of Imperial and Nazi Germany, 1866-1945
HI371E	Great Britain in the 19th and 20th Centuries
HI372	History of U.S. Foreign Relations in 20th Century
HI375	History of China
HI377	History of Asian Warfare
HI379	History of Latin America
HI380	History of the Middle East
HI391	History of World Religions
HI394	History of Revolutionary America
HI395	History of Civil War America
HI396	The Making of Modern America
HI397	History of Cold War America
HI398	Society and Culture in American History
LW481	International Law
LX____	Foreign Language Elective Courses
MS 360	Low Intensity Conflict
MS 455	Comparative Military Systems

Course #	Course Title
PL 371	Introductory Sociology
PL377	Social Inequality: Race, Gender, and Ethnicity
SS360	Political Analysis
SS366	Comparative Politics
SS371	Politics and Governments of East Asia
SS375	Politics and Governments of Former Soviet Union
SS377	European Politics
SS381	Political and Cultural Anthropology
SS383	Politics and Governments of the Middle East
SS384	Politics and Governments of Latin America
SS385	Comparative Economic Systems
SS485	Politics and Development in Sub-Saharan Africa

INTEGRATING EXPERIENCE:

- Complete the following course

Course #	Course Title
EV482	Military Geography

HONORS PROGRAM IN HUMAN GEOGRAPHY:

- Cadets pursuing the Honors Program in Human Geography must meet the entry-level requirement of having a 3.00 grade point average in the Core Curriculum and must be approved by the Geography Program Director. Cadets approved for participation in the Honors Program must complete the following courses:

Course #	Course Title
EV480	Honors Seminar in Geography
EV489B	Advanced Individual Study II



Cadets from the Department visit the Taj Mahal during the India AIAD.

ENVIRONMENTAL GEOGRAPHY

ENVIRONMENTAL GEOGRAPHY MAJOR (EGE) ENVIRONMENTAL GEOGRAPHY MAJOR WITH HONORS (EGEH)

CORE CURRICULUM AND ENGINEERING SEQUENCE:

- Complete the 26-course core curriculum
- Complete the Environmental Engineering Sequence
- Complete one (1) of the two (2) following courses:

Course #	Course Title
IT305	Theory and Practice of Military IT Systems
IT355	Advanced Theory and Practice of Military IT Systems

FOUNDATION COURSES:

- Complete the four (4) courses listed below:

Course #	Course Title
EV303	Foundations in Geography
EV389B	Climatology
EV398	Geographic Information Systems
EV486	Environmental Geography

PHYSICAL GEOGRAPHY

- Complete one (1) of the courses listed below:

Course #	Course Title
EV388A	Physical Geology
EV388B	Geomorphology
EV391B	Environmental Geology

GEOGRAPHY TOOLS AND LANDSCAPE ANALYSIS

- Complete one (1) of the courses listed below:

Course #	Course Title
EV377	Remote Sensing
EV390B	Urban Geography
EV391A	Principles of Land Use Planning and Management

REGIONAL GEOGRAPHY

- Select the following course

Course #	Course Title
EV365	Geography of Global Cultures

- Select one (1) Regional Geography course:

Course #	Course Title
EV371	Geography of Russia
EV372	Geography of Asia
EV373	Geography of Latin America
EV374	Geography of the Middle East and Africa
EV384	Geography of North America
EV386	Geography of Europe

GENERAL ELECTIVE:

- Complete one (1) course from the Environmental Geography Elective list

Course #	Course Title
EV371	Geography of Russia
EV372	Geography of Asia
EV373	Geography of Latin America
EV374	Geography of the Middle East and Africa
EV377	Remote Sensing
EV378	Cartography
EV379	Photogrammetry
EV380	Principles of Surveying
EV384	Geography of North America
EV385B	Introduction to Environmental Engineering
EV386	Geography of Europe
EV388A	Geology
EV388B	Geomorphology
EV390B	Urban Geography
EV391A	Principles of Land Use Planning and Management
EV391B	Environmental Geology
EV394	Hydrogeology
EV397	Meteorology and Air Pollution
EV399A	Geology Field Course
EV481	Water Resources Planning and Design
EV485	Special Topics in Geography and the Environment
EV489A	Advanced Individual Study in Geography
EP384	Environmental Ethics
LX_____	Foreign Language Elective Courses

INTEGRATING EXPERIENCE:

- Complete the following course

Course #	Course Title
EV482	Military Geography

HONORS PROGRAM IN ENVIRONMENTAL GEOGRAPHY:

- Cadets pursuing the Honors Program in Human Geography must meet the entry-level requirement of having a 3.00 grade point average in the Core Curriculum and must be approved by the Geography Program Director. Cadets approved for participation in the Honors Program must complete the following courses:

Course #	Course Title
EV480	Honors Seminar in Geography
EV489B	Advanced Individual Study II

ENVIRONMENTAL SCIENCE

ENVIRONMENTAL SCIENCE MAJOR (ESC) ENVIRONMENTAL SCIENCE MAJOR WITH HONORS (ESCH)

CORE CURRICULUM AND ENGINEERING SEQUENCE:

- Complete the 26-course core curriculum
- Complete the Environmental Engineering Sequence
- Complete one (1) of the two (2) following courses:

Course #	Course Title
IT305	Theory and Practice of Military IT Systems
IT355	Advanced Theory and Practice of Military IT Systems

- Complete the six (6) courses listed below:

Course #	Course Title
CH375	Introduction to Biology
EV365	Geography of Global Cultures
EV388A OR EV399A	Physical Geology OR Geology Field Course (based on selection for summer AIAD)
EV397 OR EV389B	Meteorology and Air Pollution OR Climatology
EV471	Ecology
EV487	Environmental Security

- Complete one (1) of the courses listed below:

Course #	Course Title
CH385	Introduction to Cell Biology
EV377	Remote Sensing
EV398	Geographic Information Systems

- Complete the two (2) of the seven (7) Environmental Science Directed Electives:

Course #	Course Title
CH383	Organic Chemistry I
CH384	Organic Chemistry II
EV391A	Land Use Planning and Management
EV391B	Environmental Geology
EV396	Environmental Biological Systems
EV398	Geographic Information Systems
XS391	Principles and Applications of Environmental Chemistry

- Cadets will complete one course from the following list of Environmental Science Field Electives. Cadets pursuing an HONORS PROGRAM will complete EV489A and one additional course from the following list of Environmental Science Field Electives:

ENVIRONMENTAL SCIENCE FIELD ELECTIVES

Course #	Course Title
EV377	Remote Sensing
EV378	Cartography
EV380	Principles of Surveying
EV384	Geography of North America
EV386	Geography of Europe
EV388B	Geomorphology
EV390B	Urban Geography
EV391A	Principles of Land Use Planning and Management
EV391B	Environmental Geology
EV394	Hydrogeology
EV396	Environmental Biological Systems
EV397	Meteorology and Air Pollution
EV398	Geographic Information Systems
EV401	Physical and Chemical Treatment
EV482	Military Geography
EV488	Solid and Hazardous Waste Management
EV489A	Advanced Individual Study I
XS391	Principles and Applications of Environmental Chemistry
CE302	Statics and Dynamics
CE380	Hydrology/Hydraulic Design
CH357	Microbiology
CH383	Organic Chemistry I
CH384	Organic Chemistry II
CH385	Introduction to Cell Biology
CH387	Human Physiology
CH481	Physical Chemistry I
EP386	Philosophy of Science
EP393	Environmental Ethics
LW481	International Law
MA363	Vector Calculus and ODE
MA366	Vector Calculus and Introduction to PDE
MA391	Mathematical Modeling
MA396	Numerical Methods for the Solution of DE
MA476	Mathematical Statistics
MS350	Military Communications
EM381	Engineering Economy
SS479	Environmental Economics
SS480	Public Policy Making Process

ENVIRONMENTAL ENGINEERING

ENVIRONMENTAL ENGINEERING MAJOR (EVE)

- Complete the 26-course core curriculum
- Complete the following fifteen (15) courses:

Course #	Course Title
CE302	Statics and Dynamics
CE380	Hydrology and Hydraulic Design
EV301	Environmental Science for Engineers and Scientists
EV397	Meteorology and Air Pollution
EV388A OR EV399A	Physical Geology OR Geology Field Course (based on selection for summer AIAD)
EV394	Hydrogeology
EV396	Environmental Biological Systems
EV401	Physical and Chemical Treatment
EV402	Biochemical Treatment
EV481	Water Resources Planning and Design
EV488	Solid and Hazardous Waste Treatment and Remediation
EV490	Advanced Environmental Process Design
MA366	Vector Calculus and Introduction to PDE
ME311	Thermal Fluid Systems I
XS391	Principles and Applications of Environmental Chemistry

- Complete two (2) of the following to satisfy the Environmental Engineering Field Elective requirement. The sum of the Engineering Science (ES) and Engineering Design (ED) per the current Redbook for the two Field Electives must be 4.5 credits or greater.

Course #	Course Title
CH362	Mass and Energy Balances
EE301	Fundamentals of Electrical Engineering
EM381	Engineering Economy
EM411	Project Management
EV377	Remote Sensing
EV380	Surveying
EV388B	Geomorphology
EV391B	Environmental Geology
EV398	Geographic Information Systems
EV485	Special Topics in Geography and the Environment
EV489A	Advanced Individual Study I
EV489B	Advanced Individual Study II
ME312	Thermal-Fluid Systems II
SE375	Statistics for Engineers
SE385	Decision Analysis

- Cadets pursuing an HONORS PROGRAM must complete Advanced Individual Studies I (EV489A) as one of their Filed Electives.



Environmental Engineering majors performing a research study on portable water purification units of their own design for potential use by the Army.

ENVIRONMENTAL ENGINEERING STUDIES

ENVIRONMENTAL ENGINEERING STUDIES MAJOR (EES)

- Complete the 26-course core curriculum
- Complete the following eleven (11) courses:

Course #	Course Title
IT305 or IT355	Theory & Practices (or Advanced Theory) of Military IT Systems
EV301	Environmental Science for Engineers and Scientists
EV388A OR EV399A	Physical Geology OR Geology Field Course (based on selection for summer AIAD)
EV396	Environmental Biological Systems
EV397	Meteorology and Air Pollution
EV401	Physical and Chemical Treatment
EV402	Biological Treatment
EV481	Water Resources Planning and Design
EV490	Advanced Environmental Process Design
ME311	Thermal Fluid Systems I
XS391	Principles and Applications of Environmental Chemistry

- Complete two (2) Environmental Engineering directed electives:

Course #	Course Title
CE302	Statics and Dynamics
CE380	Hydrology and Hydraulic Design
MA366	Vector Calculus and Introduction to PDE
EV394	Hydrogeology
EV488	Solid and Hazardous Waste Treatment and Remediation

- Complete one (1) course from the Environmental Engineering field electives list:

Course #	Course Title
CE302	Statics & Dynamics
CE380	Hydrology & Hydraulic Design
EE301	Fundamentals of Electrical Engineering
EM381	Engineering Economy
EM411	Project Management
EV377	Remote Sensing
EV380	Surveying
EV388B	Geomorphology
EV391B	Environmental Geology
EV394	Hydrogeology
EV398	Geographic Information Systems
EV485	Special Topics in Geography and the Environment (with approval)
EV488	Solid and Hazardous Waste Treatment and Remediation
EV489A	Advanced Individual Study I
EV489B	Advanced Individual Study II
ME312	Thermal-Fluid Systems II
SE375	Statistics for Engineers

Course #	Course Title
SE385	Decision Analysis

- No Honors Program is offered in the Environmental Engineering Studies major.



Environmental majors on their annual Graduating Firstie Boat Ride.

GEOSPATIAL INFORMATION SCIENCE

GEOSPATIAL INFORMATION SCIENCE MAJOR (GIS) GEOSPATIAL INFORMATION SCIENCE MAJOR WITH HONORS (GISH)

CORE CURRICULUM AND ENGINEERING SEQUENCE:

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

Course #	Course Title
IT305	Theory and Practice of Military IT Systems
IT355	Advanced Theory and Practice of Military IT Systems

- Complete the following Fundamentals of GIS courses:

Course #	Course Title
EV377	Remote Sensing
EV378	Computer Cartography
EV398	Geographic Information Systems

- Complete one (1) of two (2) spatial data acquisition courses:

Course #	Course Title
EV379	Photogrammetry
EV380	Principles of Surveying

- Complete two (2) advanced spatial data analysis course:

Course #	Course Title
EV477	Advanced Remote Sensing
EV498	Advanced Geographic Information Systems

- Complete the following integrative experience:

Course #	Course Title
EV482	Military Geography

- Complete the following cultural immersion course:

Course #	Course Title
EV365	Geography of Global Cultures

- Select two (2) courses from the Geospatial Information Science elective list:

Course #	Course Title
EV300	Environmental Science
EV371	Geography of Russia
EV372	Geography of Asia
EV373	Geography of Latin America
EV374	Geography of the Middle East and Africa
EV379	Photogrammetry
EV380	Principles of Surveying
EV384	Geography of North America
EV386	Geography of Europe

Course #	Course Title
EV388A OR EV399A	Physical Geology OR Geology Field Course
EV388B	Geomorphology
EV389B	Climatology
EV390B	Urban Geography
EV391A	Principles of Land Use Planning and Management
EV391B	Environmental Geology
EV397	Meteorology and Air Pollution
EV481	Water Resources Planning and Design
EV489A	Advanced Individual Study I
EV489B	Advanced Individual Study II

*NOTE: Cadets may select either EV388A or EV399A, but not both. Additionally, only cadets pursuing the Honors Program may select EV489B

- Cadets pursuing an Honors program in Geospatial Information Science must complete the following course, and select one additional course from the GIS electives list:

Course #	Course Title
EV489A	Advanced Individual Study I



GIS cadets receive a briefing from 2LT Whitney Hall (Class of 2003) outlining her duties while deployed to Iraq.

COURSE OFFERINGS

Course #	Course Title	061	062	071	072	081	082
EV203	Physical Geography	X	X	X	X	X	X
EV300	Environmental Science	X		X		X	
EV301	Env Sci for Engineers	X		X		X	
EV303	Foundations in Geography	X		X		X	
EV350	Environmental Technologies		X		X		X
EV365	Geography of Global Cultures	X	X	X	X	X	X
EV371	Geography of Russia	X		X		X	
EV372	Geography of Asia		X		X		X
EV373	Geography of Latin America	X		X		X	
EV374	Middle East & Africa		X		X		X
EV377	Remote Sensing	X	X	X	X	X	X
EV378	Cartography	X		X		X	
EV379	Photogrammetry		X		X		X
EV380	Principles of Surveying	X	X	X	X	X	X
EV384	Geography of North America	X		X		X	
EV385	Introduction to Env Engineering		X		X		X
EV386	Geography of Europe		X		X		X
EV388A	Physical Geology	X	X	X	X	X	X
EV388B	Geomorphology		X		X		X
EV389B	Climatology	X		X		X	
EV390B	Urban Geography		X		X		X
EV391A	Land Use Plan & Management	X		X		X	
EV391B	Environmental Geology		X		X		X
EV394	Hydrogeology	X		X		X	
EV396	Environmental Biological Systems		X		X		X
EV397	Meteorology and Air Pollution		X		X		X
EV398	Geographic Information Systems		X		X		X
EV399A	Geology Field Course	AIAD – STAP Period					
EV401	Physical and Chemical Treatment		X		X		X
EV402	Biochemical Treatment	X		X		X	
EV450	Environmental Decision Making	X		X		X	
EV471	Ecology	X		X		X	
EV477	Advanced Remote Sensing		X		X		X
EV480	Honors Seminar in Geography			X		X	
EV481	Water Resources	X		X		X	
EV482	Military Geography		X		X		X
EV483	Colloquium in Geography		X		X		X
EV485	Special Topics: Geography and the Environment	X	X	X	X	X	X
EV486	Environmental Geography	X		X		X	
EV487	Environmental Security		X		X		X

Course #	Course Title	061	062	071	072	081	082
EV488	Solid and Hazardous Waste		X		X		X
EV489A ¹	AIS in Geography	X	X				
EV489B ¹	AIS in GIS	X	X				
EV489C ¹	AIS of the Environment	X	X				
EV489A ²	Advanced Individual Study I			X	X	X	X
EV489B ²	Advanced Individual Study II				X		X
EV490	Advanced Env Process Design		X		X		X
EV498	Advanced GIS	X		X		X	
XS391	Principles and Applications of Environmental Chemistry	X		X		X	

NOTE 1: This course will no longer be offered after the graduation of the Class of 2006.

NOTE 2: This course will become the Independent Study course for the class of 2008 and those that follow.



Cadets John Anderson, Wade Smith, Alejandro Alves, and Gretchen Carlin visit a tea plantation in Indonesia during the Southeast Asia AIAD – July 2004.

COURSE DESCRIPTIONS

EV203	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

EV300	ENVIRONMENTAL SCIENCE
	3.0 Credit Hours (BS=1.0, ES=1.5, ED=0.5); Prerequisite: EV203; Disqualifier: EV301, 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 the fall semester.

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

LABS: None

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

EV301	ENVIRONMENTAL SCIENCE FOR ENGINEERS AND SCIENTISTS
	3.0 Credit Hours (BS=1.0, ES=1.5, ED=0.5); Prerequisites: EV203; Disqualifier: EV300, 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 the fall semester.

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

LABS: 1 Field Trip, 2 In-class Labs

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

EV303	FOUNDATIONS IN GEOGRAPHY
	3.0 Credit Hours; Prerequisite: None

** To be taken in 5th academic term for all cadets choosing a Human and Environmental Geography major*

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 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 major in the Department of Geography & Environmental Engineering.

EV350	ENVIRONMENTAL TECHNOLOGIES
Env CES Course	3.0 Credit Hours (BS= 0.0, ES=2.0, ED=1.0), Prerequisites: CH102 or CH152, MA205 or MA255, and EV300 or EV301, Disqualifiers: EV385

SCOPE: This course continues the discussion of environmental issues introduced in EV300 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.

EV365	GEOGRAPHY OF GLOBAL CULTURES
	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.

EV371	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.

EV372	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.

EV373	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.

EV374	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.

EV377	REMOTE SENSING
	3.0 Credit Hours (ES=2.5, ED=0.5); Prerequisite: EV203, IT105 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

EV378	CARTOGRAPHY
	3.0 Credit Hours (ES=2.5, ED=0.5); Prerequisite: EV203, IT105 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.

EV379	PHOTOGRAMMETRY
	3.0 Credit Hours (BS=0.5, ES=2.5); Prerequisite: EV203, IT105 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

EV380	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.

EV384	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 discussions of videos, current events and maps to reinforce the understanding of important themes that are prevalent in each of North America's 15 regions. 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.

EV385	INTRODUCTION TO ENVIRONMENTAL ENGINEERING
	3.5 Credit Hours (ES=2.5, ED=1.0); Prerequisite: CH102, CH152, MA205, MA255; Corequisites: PH204, PH254 Disqualifier: EV350, EV385B

SCOPE: This ABET supporting course introduces cadets to the study of environmental engineering from a unit process and a materials balance approach. The focus is design-oriented problem solving to protect human health and the health of ecosystems using fundamental physical, chemical, and biological processes. The concept and calculation of risk is introduced as a key factor in environmental decision-making. Through the study of contaminant removal from water and air to integrated management techniques for solid/hazardous wastes and ionizing radiation, cadets are exposed to the breadth of the discipline. In the laboratory the science behind physical, chemical, and biological processes are applied to the engineering discipline. A course design problem allows application of engineered solutions to timely water and air quality issues.

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

LABS: 6 @ 120 min

SPECIAL REQUIREMENTS: Course design project.

EV386	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.

EV388A	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.

EV388B	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.

EV389B	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.

EV390B	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 research project; compensatory time provided.

EV391A	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.

EV391B	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.

EV394	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

SPECIAL REQUIREMENTS: None.

EV396	ENVIRONMENTAL BIOLOGICAL SYSTEMS
	3.5 Credit Hours (BS=1.0, ES=2.5); Prerequisites: CH102 or CH152, EV203 and EV300 or EV301 or EV385

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.

EV397	METEOROLOGY AND AIR POLLUTION
	3.0 Credit Hours (BS=0.5, ES=2.0, ED=0.5); Prerequisite: EV203

SCOPE: This course explores the fundamental principles of meteorology and air pollution. The meteorology subcourse includes topics such as atmospheric structure, winds, clouds, precipitation, stability, and weather systems. The air pollution subcourse begins with a study of air pollutant types, sources, and air quality. It then applies the knowledge of weather processes towards the understanding of air pollution environmental and health effects as well as atmospheric dispersion. The study of air pollution concludes with conceptualization and quantification of various air pollution control systems and a qualitative look at both mobile sources of air pollution and indoor air quality.

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

LABS: In-class labs

SPECIAL REQUIREMENTS: None.

EV398	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.

EV399A	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.

EV401	PHYSICAL AND CHEMICAL TREATMENT
	3.5 Credit Hours; (ES=2.0, ED=1.5); Prerequisite: XS391; Corequisite: ME311, ME362, EM362A

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: 12 @ 55 minutes (Double Hour)

SPECIAL REQUIREMENTS: One term project.

EV402	BIOCHEMICAL TREATMENT
	3.5 Credit Hours (ES=2.0, ED=1.5); Prerequisites: EV396, ME311, ME362, EM362A

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 the spring semester.

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

LABS: 7 x 120 minutes

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

EV450	ENVIRONMENTAL DECISION MAKING
Env CES Course	3.0 Credit Hours; (BS=0.0, ES=2.0, ED=1.0); 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.

EV471	ECOLOGY
	3.0 Credit Hours; (BS=1.0, ES=0.5, ED=0.0); Prerequisites: CH385 or CH375 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

EV477	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.

EV480	HONORS SEMINAR IN GEOGRAPHY
	3.0 Credit Hours; Must be selected for participation in the Honors Program

SCOPE: This course will examine major research initiatives in the discipline and delineate their data requirements. The primary objective of this course is to identify and outline the senior thesis, which is the culminating event for the Honors Program. Hence, cadets participating in this course will explore research methods and data sources used by geographers, conduct a critical analysis of seminal literature in the field, define a research problem, identify and evaluate data sources, and assemble a research proposal. The final product of this course will be a written research proposal that will define the senior thesis (written during EV489B). The cadet will make a formal presentation of this proposal to senior geography faculty. The course is conducted in a seminar and one-and-one format.

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

SPECIAL REQUIREMENTS: n/a.

EV481	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 the fall semester.

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

LABS: None

SPECIAL REQUIREMENTS: Written and oral research reports on a water resources project.

EV482	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.

EV483	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.

EV485	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.

EV486	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.

EV487	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 an interdisciplinary team project. Offered only in the spring semester.

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

LABS: None

SPECIAL REQUIREMENTS: None.

EV487B	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

EV487C	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

EV488	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.

EV489	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.

EV489A	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. Note this course will be renamed Advanced Individual Study I beginning with Term 071.

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

SPECIAL REQUIREMENTS: As determined by faculty advisor.

EV489B	ADVANCED INDIVIDUAL STUDY II
	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. Note this course will be renamed Advanced Individual Study II beginning with Term 071.

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

SPECIAL REQUIREMENTS: As determined by the faculty advisor.

EV489C	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. Note: this course will be no longer offered after Term 062.

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

SPECIAL REQUIREMENTS: As determined by the faculty advisor.

EV490	ADVANCED ENVIRONMENTAL PROCESS DESIGN
	3.5 Credit Hours (ES=1.5, ED=2.0); Prerequisites: EV301 or EV385B; 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: Two design problems. First class cadets only.

EV498	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.

XS391	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 or MA154

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: Various in-class labs

SPECIAL REQUIREMENTS: None



Environmental Engineers taking lake bed samples at Long Pond.



Cadets at the Grand Canyon during the Four Corners AIAD, June 2005.



A cadet enrolled in EV380 (Surveying) taking measurements during a field lab.



Cadets enrolled in EV388B (Geomorphology) conducting coastal research at Sandy Hook, New Jersey



CDT Nick Shaw and participants in the Four Corners AIAD walk through Arizona's Canyon de Chelly on the way to Ancestral Puebloan cliff dwellings.

DEPARTMENT FACULTY

PERMANENT MILITARY 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

Staff Officer, Operation Enduring Freedom,
Afghanistan, 2005

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 Infantry 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

Company XO, A/1-501st IN, 101st ABN Division, FT Campbell, KY, 1980-81

Aide de Camp, HHC, 101st ABN Division, FT Campbell, KY, 1979-80

PLT Leader, Aide de Camp, Company XO, 101st ABN Div., FT Campbell, KY, 1978-79



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 authored or co-authored 10 books, several Instructor's Manuals to accompany college textbooks, numerous book chapters, monographs, and dozens of 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, Urban Geography, Geography of Latin America, and Geography of Global Cultures. ★

COLONEL 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, Riyadh, 2001-2002
XO, 3d Squadron, 3 ACR, 1995
S3, 3d Squadron, 3 ACR, 1994-1995
Regimental Adjutant, 3 ACR 1993-1994
Asst. 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 Bde, 3d Armored Division,
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 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 three books, three physical geography study guides, and more than 20 professional articles on various geographic and military subjects. LTC Galgano's dissertation research included shoreline change mapping of the mid-Atlantic coast to delineate shorelines movements and assess the impact of tidal inlets on coastal configuration. LTC Galgano is the Geography Program Director and serves as the course director for EV388B (Geomorphology), EV482 (Military Geography), EV486 (Environmental Geography), EV489A (Advanced Individual Study in Geography), and EV480 (Honors Seminar in Geography). ★

LTC STEVEN D. FLEMING

Academy Professor, Geospatial Information
Science

Ph.D., University of Georgia, 2004
M.A., Naval War College, 1999
M.A., University of Georgia, 1995
B.S., USMA, 1985

Assistant Division Air Defense Officer, 4th Infantry
Division, Fort Hood, Texas 2000-2001
Battalion S-3, 1-44 ADA, 4th Infantry Division, Fort
Hood, Texas 1999-2000

Aide-de-Camp to the Superintendent, USMA,
1997-1998

Instructor/Assistant Professor, Department of
Geography and Environmental Engineering,
USMA, 1995-1998

Battery Commander, A/1-62 ADA, 25th Infantry Division, Schofield Barracks, Hawaii, 1992-
1993

Assistant Battalion S-3/Brigade Liaison Officer, 1-62 ADA, 25th Infantry Division, Schofield
Barracks, Hawaii, 1990-1992

Battalion S-1, 5-62 ADA, 11th ADA Brigade, Fort Bliss, Texas, 1988-1990

Assistant Battalion S-3, 5-62 ADA, 11th ADA Brigade, Fort Bliss, Texas, 1988

Platoon Leader, 5-62 ADA, 11th ADA Brigade, Fort Bliss, Texas, 1986-1988

Platoon Leader, 4-1 ADA, 11th ADA Brigade, Fort Bliss, Texas, 1985-1986



LTC Fleming is an Air Defense officer with command and staff experience in short-range air defense operations at the battalion, brigade and division levels. Academically, LTC Fleming specializes in geospatial information sciences with particular interest in large-scale mapping of coastal regions. He has taught EV203 (Physical Geography), EV379 (Photogrammetry), EV380 (Surveying), EV485 (Topics in Geography and the Environment) and EV489B (Advanced Independent Study in GIS). LTC Fleming currently teaches EV203 (Physical Geography). ★

LTC MICHAEL D. HENDRICKS

Assistant Professor, Geospatial Information Science

Ph. D., University of Maine – Orono, 2004

M.S., University of South Carolina, 1994

B.S., University of Delaware, 1986

Battalion XO, 29th Engineer Battalion
(Topographic), Fort Shafter, HI 2000-2001
Geospatial Operations Officer & Detachment
Commander, 5th Planning and Control, U.S.
Army Pacific (USARPAC), Fort Shafter, HI
1999-2000

Instructor and Assistant Professor, Department of
Geography and Environmental Engineering
USMA, 1995-1998

Company Commander, A Co, 13th Engineer
Battalion (Light), Fort Ord, CA, 1992-1993

Asst Operations Officer, 13th Engineer Battalion (Light), Fort Ord, CA, 1991-1992

Company XO, HQ Co, 317th Engineer Battalion (Mech), Germany, 1989-1990

Platoon Leader, A Co, 317th Engineer Battalion (Mech), Germany 1987-1989



LTC Hendricks is an Engineer Officer specializing in Geospatial Information Operations. His recent military experience was with the 29th Engineer Battalion (Topographic) supporting PACOM, USARPAC, and numerous other organizations in the Pacific region with mapping and geospatial intelligence. His research interests include; GIS education, supporting navigation and mobility analysis in dynamic and uncertain settings, and mobile mapping. In addition, he is involved in producing large-scale topographic maps for the sport of Orienteering. LTC Hendricks teaches EV377 (Remote Sensing), EV398 (Geographic Information Systems) and EV498 (Advanced Geographic Information Systems). ★

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 (Physical Geography), as well as EV365 (Geography of Global Cultures), EV388B (Geomorphology), and EV384 (Geography of North America). 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
Diplomate, American Academy of Environmental Engineers 2000

Deputy Regimental Rear Commander, 2nd ACR, FT Polk, LA 1997-98
Regimental Chemical Officer, S1, XO, & LNO, 2nd ACR, FT Polk, LA 1996-97
Assistant Professor, D/G&EnE, 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. He has taught EV203 (Physical Geography), EV300 (Environmental Science), EV301 (Environmental Science for Engineers & Scientists), EV385 (Introduction to Environmental Engineering), EV401 (formerly Environmental Systems Analysis), EV402 (formerly Environmental Systems Design), EV481 (Water Resources Management), and EV488 (Solid and Hazardous Waste Management and Design). LTC Lynch is the Environmental Engineering Sequence Coordinator and course directs several environmental courses throughout the academic year. ★

CIVILIAN FACULTY

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, Humboldt 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. MARIE C. JOHNSON

Professor of Geology, 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 EV301 (Environmental Science for Engineers and Scientists), EV391B (Environmental Geology), EV399A (Geology Field Course), EV471 (Ecology), and EV388A (Physical Geology). ★

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 has been 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. 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). ★

Dr. AMY K. RICHMOND
Assistant Professor, Geography

PhD., Geography, Boston University, 2005
M.A., Energy and Environmental Analysis, 2002
B.S., Environmental Studies, 2000, magna cum
laude

Research fellow, Boston University, 2002-2005
Teaching fellow, Boston University, 2001



Dr. Richmond is a Geographer who applies her skills to understanding the interactions between environmental resources and economic systems. Specifically she uses statistical models, GIS, remote sensing data, and economic data to research the interactions between marketed and non-marketed environmental resources and the economy. She is the author of several articles in professional journals and often presents papers at national conferences. Dr. Richmond teaches EV203 (Physical Geography). ★

ROTATING MILITARY 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, Ger,
1993-94
S-3, 2-14th FA Bn (MLRS), Bamberg, Ger, 1992-93
Asst. IG, USAEUR & 7th Army, Heidelberg,
Ger, 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, CP. Stanley, Korea 1982
S/F Plt Ldr, E Btry, 25th FA (TA), 2nd Inf Div, CP. 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 urban areas and transnational natural resources. He is currently teaching and is the course director for EV371 (Geography of Russia and the FSU), EV386 (Geography of Europe) and EV365 (Geography of Global Cultures). He has taught EV203 (Intro to Physical Geography), and EV482 (Military 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. LTC Gilewitch is the course director for EV203 (Physical 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 an 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. 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 EV203 (Physical Geography), EV391B (Environmental Geology), EV399A (Field Geology), EV450 (Environmental Decision Making), EV482 (Military Geography), and EV489C (Advanced Individual Study of the Environment). Currently, he serves as course director for EV300 (Environmental Science), EV385B (Introduction to Environmental Engineering) and EV471 (Ecology). ★

LTC BEATRICE LAMBERT

Assistant Professor, Environmental Engineering

P.E. State of Delaware
M.S. Environmental Engineering, Texas A&M
B.S. Civil Engineering, University of Southern
California

Department of G&EnE, USMA
Department of Math, USMA
United States Operational Test Command
62nd Engineer Combat Battalion (Heavy)
84th Engineer Combat Battalion (Heavy)



LTC Lambert is an Operational Engineer Officer. She has leadership experiences at a variety of command levels and has had the opportunity to work as an engineer at numerous levels as well. As a member of the USMA Faculty, she has taught MA103 (Discrete Dynamical Systems), MA104 (Differential Calculus), and MA205 (Integral Calculus), EV203 (Physical Geography) and was the Course Director for EV385B (Introduction to Environmental Engineering). She currently teaches EV450 (Environmental Decision Making). ★

LTC STEVEN OLUIC

Assistant Professor, Geography

Ph.D., Kent State University, 2005

M.S., University of Cincinnati, 1991

B.A., Case Western Reserve University, 1983

Professor of Military Science, Kent State
University, 2000-02

Student, German Armed Forces Staff College,
Hamburg, Germany, 1998-2000

Brigade S4, Engineer Bde, 1st Infantry Division,
Germany, 1997-98

XO, 54th Engineer Bn, 130th En Bde, Germany,
1997

S3, 54th Engineer Bn, 130th En Bde, Germany, 1996

Senior Engineer Observer/Controller, Combat

Maneuver Training Center, Hohenfels, Germany, 1995-96

Project Engineer, Baltimore District, Corps of Engineers, 1992-95

Company Commander, 16th Engineer Bn, 1st Armored Division, Germany, 1989-90

Adjutant, 16th Engineer Bn, 1st Armored Division, Germany, 1988-89

Liaison Officer, 16th Engineer Bn, 1st Armored Division, Germany, 1987

XO/Platoon Leader, 802nd Engineer Bn, Republic of Korea, 1986-87

XO, HHC, Engineer School Brigade, Ft Belvoir, Va., 1985-86

XO/Platoon Leader, 11th Engineer Bn, Ft. Belvoir, Va. 1984-85



LTC Oluic is an Engineer officer with command and staff experience in combat and construction units at battalion, brigade and division level. The majority of his operational experience has been overseas. LTC Oluic is a human geographer with expertise in nationalism, ethnic identity and Balkan area studies. His academic background spans geology, environmental science and geography. LTC Oluic's dissertation research focused on the concept of national identity and nationalist landscapes in Bosnia and their impact on the future of the Bosnian state. He has authored several articles/reviews and was the recipient of the 2004 Association of American Geographers Hoffman Award. LTC Oluic teaches EV203 (Physical Geography) and EV365 (Geography of Global Cultures). ★

MAJ BRIAN P. BAILEY

Assistant Professor, Geospatial Information Science

M.S., University of Maine – Orono, 2003

B.S., 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



MAJ 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, MAJ 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). MAJ Bailey teaches EV203 (Physical Geography), EV380 (Principles of Surveying), and EV398 (Geographic Information Systems). ★

MAJ PHILIP J. DACUNTO

Instructor, Environmental Engineering

M.S., Stanford University, 2004

B.S., USMA, 1995

P.E., State of Missouri, 2004

Cdr, A Co. 41st Engineer Bn, Ft Drum, NY 2001-2002

Ass't Division Engineer LNO, 10th Mtn Div, 2000-2001

Ass't Bde Engineer, 1st Bde 25th ID, 1998-1999

Executive Officer, A/65th En Bn, Ft Lewis WA 1997-1998

Platoon Leader, A/65th En Bn, Ft Lewis, WA, 1996-1997



MAJ Dacunto is an engineer officer who has served in light divisional units, including the 10th Mountain and 25th Infantry Divisions. In those units, he led "sappers" that focused primarily on support to the light infantry. He deployed to Bagram Airbase, Afghanistan in 2002 in support of Operation Enduring Freedom; in addition, he has deployed to the Joint Readiness Training Center (JRTC) and the National Training Center (NTC). MAJ Dacunto is a licensed environmental engineer in the State of Missouri, and has a master's degree in environmental engineering from Stanford University. His research interests include water and wastewater treatment, as well as air pollution control. Most recently, he assisted with a Stanford University research project that studied the use of activated carbon to remediate San Francisco Bay sediments contaminated by polychlorinated biphenyls (PCBs). MAJ Dacunto teaches EV397 (Meteorology and Air Pollution), EV401 (Physical and Chemical Processes), and EV450 (Environmental Decision Making). ★

MAJ BRIAN J. DOYLE

Instructor, Geography

M.A., North Carolina at Chapel Hill, 2004

B.A., Norwich University, 1994

Commander, A Troop, 1-1 Cavalry, Germany 2000-2002

Assistant S3, 1-1 Cavalry, Germany, 1999-2000

S3, 1-46 Infantry, Fort Knox, KY, 1997-1998

Executive Officer, E Company, 1-46 Infantry, 1996-1997

Executive Officer, B Troop, 5-17 Cavalry, Republic of Korea, 1995-1996

Platoon Leader, B Troop, 5-17 Cavalry, Republic of Korea, 1996



MAJ Doyle is an armor officer who has served primarily in cavalry units. His experiences include several rotations at the Combined Maneuver Training Center (CMT) as a Troop Commander and as a Battle Captain. MAJ Doyle received a master's degree in Geography at the University of North Carolina, Chapel Hill. He is a human geographer with interests in political and economic geography. His thesis is titled "Geostrategic Capital: Investment Strategies for Foreign Capital in European Union Accession States". His research combines GIS mapping techniques with data sets collected on economic indicators across Europe to explore the role of geographic proximity and borders in facilitating development. ★

MAJ WILLIAM J. EPOLITO

Instructor, Environmental Engineering

M.S.E., Georgia Institute of Technology, 2004

B.S., Clarkson University, 1994

EIT, New York, 1994

Battalion S3, 82^d Chem. Bn, 3^d Chemical Bde, 2001-2002

Commander, C/82^d Chem. Bn, 3^d Chemical Brigade, 2000-2001

S3, Chemical Defense Training Facility, U.S. Army Chemical School, 1998-1999

XO, Chemical Ammunition Company, U.S. Chemical Activity, Pacific (USACAP), Johnston Atoll, 1997-1998

Bde Chem. Officer, 11th Air Defense Artillery Bde, 1996-1997

XO, HHC, 2-7 Air Defense Artillery Bn, 11th Air Defense Artillery Bde, 1996

S4, 2-7 Air Defense Artillery Bn, 11th Air Defense Artillery Bde, 1995-1996

Bn Chem. Officer, 2-7 Air Defense Artillery Bn, 11th Air Defense Artillery Bde, 1994-1995



MAJ Epolito is a Chemical Corps officer and has served in command and staff positions from company to brigade level. He has experience in nuclear, chemical and biological defense; chemical weapons storage, maintenance and transportation; and nerve agent training. MAJ Epolito is an environmental engineer interested in the chemical processes that affect environmental systems and processes. He is currently the Department Executive Officer and teaches XS391 (Principles and Applications of Environmental Chemistry). ★

MAJ BRIAN A. FORN

Assistant Professor, 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



MAJ 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). MAJ 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. MAJ Forn is a geographer particularly interested in the cultural and historical geography of Latin America. MAJ Forn teaches EV365 (Geography of Global Cultures), EV373 (Geography of Latin America) and EV390B (Urban Geography). ★

MAJ LUIS A. RIOS, US Air Force

Instructor, Geography

M.S., Texas A&M University, 1995

B.S., Rutgers University, 1989

Chief, Current Ops Division, Offutt AFB, 2003-2004

Chief, Standards & Eval Branch, Offutt AFB, 2001-2003

Cdr, Weather Flight, Charleston AFB, 1997-2001

Leader, Atmospheric Analysis Models, Offutt AFB, 1995-1997

Satellite Coordinator, Lajes AB, The Azores, 1992-1993

Wing Weather Officer, Nellis AFB, 1989-1992



Maj Rios is an Air Force weather officer who has served in weather flights, weather squadrons and the Air Force Weather Agency (AFWA) in support of classified national programs, standardization and evaluation (Stan/Eval), Army aviation, tactical air forces and mobility air forces. His contingency/deployment history includes DESERT STORM in 1992, Operation RESTORE HOPE in 1993, and Operation ALLIED FORCE in 1999. While serving as a combat weather flight commander, he helped certify the employment of C-17A cargo aircraft for use by Army paratroopers. Maj Rios received a Masters Degree in meteorology with emphasis on analysis and forecasting. His academic interests include tropical meteorology, climatology, lightning meteorology and the operational applicability of meteorological and climatic techniques. Maj Rios teaches EV203 (Physical Geography) and is developing a new basic meteorology course. ★

MAJ MICHAEL E. SENN

Assistant Professor, 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



MAJ 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). MAJ 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". MAJ Senn teaches EV203 (Physical Geography) and EV389B (Climatology). ★

MAJ MARK A. SMITH

Assistant Professor, Environmental Science

Ph.D., University of Wisconsin, Madison, 2002
M.S., University of Wisconsin, Madison, 1989
B.S., Oregon State University, 1985

Theater Missile Defense Officer and Balkans Reserve Force Desk Officer, Joint Force Command, Naples, Italy, 2002-2005
S-3, 5-7 ADA, Hanau Germany, 2001-2002
Operations and Training Officer, Extended Air Defense Task Force, Giessen, Germany, 1999-2001
Team Leader, 432nd Civil Affairs Battalion, Green Bay, WI, 1998-1999
Detachment Commander, 2/335th Bn, 4 Bde, Madison, WI, 1997-1998
OIC, Observer Controller Lanes Team, 2/335th Bn, 4 Bde, Madison, WI, 1996-1997
Platoon Leader, Observer Controller Lanes Team, 2/335th Bn, 4 Bde, Madison, WI, 1994-1996
Force Air Defense Officer, Allied Command Europe Mobile Force Land and S-5, Wackernheim, GE, 1991-1994
Platoon Leader, 5/3 ADA, Wackernheim, GE, 1990-1991
Platoon Leader, 3/5 ADA, Buedingen, GE, 1990



MAJ Smith is an Air Defense officer with experience in a wide variety of assignments, to include joint and combined tours with NATO and European Union forces. MAJ Smith has also served two combat tours to Iraq (Platoon Leader during DESERT STORM, and NATO LNO to Multi-National Corps Iraq in support of the NATO training Mission in Iraq). MAJ Smith holds a joint PhD in Wildlife Ecology and Zoology from the University of Wisconsin-Madison. His dissertation research and interests are about integrating military training and wildlife on military lands. He teaches EV203 (Physical Geography), EV300 (Environmental Science), and EV301 (Environmental Science for Engineers and Scientists). ★

MAJ THOMAS C. TIMMES

Assistant Professor, 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 EV300 (Environmental Science), EV350 (Environmental Technologies), and EV402 (Biochemical Treatment). ★

CPT JAMES F. CHASTAIN

Instructor, Geography

M.A., University of South Carolina, 2005
B.A., Presbyterian College, 1996

Commander, B Co. 532d Military Intelligence Battalion (Theater A.C.E.), Cp. Humphreys, Republic of Korea, 2002-2003
G-2 Operations Officer, 2d Infantry Division, Cp. Red Cloud, Republic of Korea, 2001-2002
Commander, 1st Target Acquisition Detachment (Airborne), Ft Bragg, N.C. 1999-2000
Ammunition Platoon Leader, 3d Battalion 27th Field Artillery Regiment (MLRS), Ft Bragg, N.C. 1998-1999
Firing Platoon Leader, 3d Battalion 27th Field Artillery Regiment (MLRS), Ft Bragg, N.C. 1997-1998



CPT Chastain is a Military Intelligence officer who has served in tactical, operational and strategic units. He was branch detailed to Field Artillery during which time he led Multiple Launch Rocket System (MLRS) platoons and commanded the XVIII Airborne Corps Artillery and 82d Airborne Division's Fire-Finder radar detachment. He deployed to Kuwait in 1999 in support of Central Command's Operation Southern Watch. Following the Military Intelligence Captain's Career Course, CPT Chastain served in the 2nd Infantry Division. CPT Chastain is a Political Geographer whose area of interest is globalization and international security. His thesis studied the socio-demographic correlates of support for the far-right French politician Jean-Marie Le Pen. CPT Chastain teaches EV203 (Physical Geography). ★

CPT ALLISON L. DAY

Instructor, Geospatial Information Systems

M.S., University of Wisconsin, 2005
B.S., University of Missouri, 1995

Engineer Team Chief, 1/338th Regiment, 2d Brigade, 85th Training Support Division, Fort McCoy, Wisconsin, 2002-2004
Company Commander, HHC, 70th Engineer Battalion (M), 3d Brigade, 1st Armor Division, Fort Riley, Kansas, 2003-2004
Assistant S-3, 70th Engineer Battalion (M), 3d Brigade, 1st Armor Division, Fort Riley, Kansas, 2003
S-4, 29th Engineer Battalion (T), 45th Corps Support Group, Fort Shafter, Hawaii, 1998-1999
Terrain Analysis and Print Platoon Leader, 70th Engineer Company, 29th Engineer Battalion, 45th CSG, Fort Shafter, Hawaii, 1996-1997



CPT Day enlisted in the Missouri National Guard as a unit level communications maintainer. After earning a B.S. in forestry, she entered active duty as an engineer officer. CPT Day has command and staff experience in mechanized and topographic engineer battalions. Her most recent field assignment was in an AC/RC position, assisting engineer units to train and mobilize in support of Operation Iraqi Freedom. She then attended the University of Wisconsin and received her master's degree in Environmental Monitoring: Remotely Sensed Imagery and Geospatial Information Management. CPT Day teaches EV203 (Physical Geography). ★

CPT MINDY A. KIMBALL

Instructor, Environmental Engineering

M.S., California State University Hayward, 2005
B.S., United States Military Academy, 1996

Personnel Operations Officer, 3^d SSB, Fort Stewart, GA, 2002-2003
Battalion S-3, 3^d SSB, Fort Stewart, GA, 2002
Commander, B/509th PSB, Camp Stanley, Korea, 2000-2001
Strength Manager, MND(N), SFOR6, Bosnia-Herzegovina, 1999-2000
Officer Strength Manager, G1, 10th Mtn Div (LI), Fort Drum, NY, 1998-1999
Assistant Personnel Operations Officer, G1, 10th Mtn Div (LI), Fort Drum, NY, 1996-1997



CPT Kimball is an Adjutant General's Corps officer with experience supporting three different divisions, serving at both the battalion level and division staff. She deployed to Bosnia-Herzegovina in 1999 as part of SFOR6 in support of Operation Joint Forge. In Korea CPT Kimball commanded a multifunctional personnel detachment, including a postal platoon, servicing soldiers of the 2nd Infantry Division stationed from Camp Stanley up to the DMZ. Her research interests include geophysics, tectonics, tectonophysics, paleoseismology, and geologic mapping. Her graduate thesis involved using geophysics (seismic refraction and ground penetrating radar) on active strike-slip fault zones in order to detect subsurface fault planes at depths as deep as 15 meters. CPT Kimball teaches EV203 (Physical Geography), EV388A (Physical Geology), and EV399A (Geology Field Course). ★

CPT CHRISTOPHER E. OXENDINE

Instructor, Geospatial Information Science

M.S., University of Wisconsin - Madison, 2004

M.A., Webster University, 2001

B.S., USMA, 1996

Commander, 6th MP Detachment, Ft Rucker, 2000-2002

S-3, USAIC MP CO, Ft Benning, 1999-2000

Platoon Leader, 3rd MP CO, Ft Benning, 1998-99

Platoon Leader, 988th MP CO, Ft Benning, 1996-98



CPT Oxendine served as a Military Police officer in the 3rd Infantry Division. He has deployed in support of Operation Desert Spring (Kuwait) and to the National Training Center (NTC). CPT Oxendine has a Master's degree in Cartography and GIS. His academic interests include GIS, cartography, and geographic visualization. His thesis is titled "Integrating GIS with Remote Sensing to Detect the Flat-top Pine Tree: An Important Element of the Red-Cockaded Woodpecker's Habitat." CPT Oxendine teaches EV203 (Physical Geography) and EV379 (Photogrammetry). ★

CPT MEGAN B. PEGUERO

Instructor, Geography

M.A., University of Maryland, 2004

M.A., Webster University, 2001

B.S., USMA, 1995

Commander & Chief, Military Personnel, HQs 1st Region ROTC, Ft Bragg, 1999-2001

Enlisted Strength Mgr, 1st Region ROTC, Ft Bragg, NC, 1999

Commander, HHC, 24th PSB, Ft Stewart, GA, 1997-1999

Deputy Chief, G1 Plans & Operations, Ft Stewart, GA, 1997

Division Officer Strength Mgr, Ft Stewart, GA, 1996-1997



CPT Peguero served as an Adjutant General's Corps officer in the 3rd Infantry Division and First Region ROTC. She participated in several rotations at the National Training Center (NTC) and prepared units for deployment to Operation Desert Thunder (Kuwait) and Operation Desert Fox (Kuwait). CPT Peguero holds master's degrees in Geography and Human Resources Development. She is a physical geographer interested in coastal land use and geomorphology and her scholarly paper is titled "Choices to Consequences: Coastal Policy Decisions for a Barrier Island on Long Island." CPT Peguero teaches EV203 (Physical Geography) and EV391A (Land Use Planning and Management). ★

CPT BENJAMIN M. WALLEN

Instructor, Environmental Engineering

M.S., University of Texas at Austin, 2005
M.S., University of Missouri at Rolla, 2000
B.S., United States Military Academy, 1996
E.I.T., State of Delaware, 1996

Commander, A Co., 70th Engineer Battalion, Ft Riley, KS, 2001 – 2003
Assistant Brigade Engineer, 3rd Brigade, 1st Armored Division, Ft Riley, KS, 2001
Company XO, B/588th Engineer Battalion, Ft Hood, TX, 1999 – 2000
Battalion S-1, 588th Engineer Battalion, Ft Hood, TX, 1998 – 1999
Assault & Obstacle Platoon Leader, A/588th Engineer Battalion, Ft Hood, TX, 1998
Support Platoon Leader, 588th Engineer Battalion, Ft Hood, TX, 1997 – 1998
Platoon Leader, C/588th Engineer Battalion, Ft Hood, TX, 1997



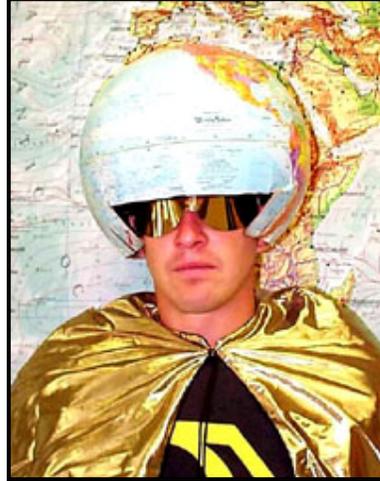
CPT Wallen is an engineer officer who has served in both mechanized and armored divisional units. Most recently, he led his company in Iraq from May through July 2003, where he served as the Director of Public Works (water, sewage, fire, trash, electricity) for the Kadhimiyah District in Baghdad and focused on unexploded ordnance (UXO) removal. He has deployed to the National Training Center (NTC) five times, serving in a different role each time. He also deployed to Korea in support of FOAL EAGLE 1999. His academic interests include water and wastewater treatment, as well as indoor air pollution control. Most recently, he assisted with research at the University of Texas at Austin dealing with heterogeneous (surface) reactions that occur in buildings during disinfection for biological warfare agents such as bacillus anthracis (Anthrax). CPT Wallen teaches EV300 (Environmental Science) and EV350 (Environmental Technologies). ★

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. ★



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



Department-led Army Orienteering Club members.



Cadets on the Geology Field Course get "hands-on" with earthmoving equipment.

FIRST REGIMENT MAJORS

Company A1			Company E1	
06 BESSLER, ALLISON	Hum Geo		06 KLEIN, DOUGLAS	GIS
06 CASCIATO, ABBY	Hum Geo		06 ROE, CHASE	Env Eng
06 KNOX, DAVID	Env Eng		06 SMALL, JAMES	Hum Geo
06 RITCHEY, ASHLEY	Hum Geo		06 WHITFIELD, GEOFFREY	Hum Geo
06 ROBERTS, BRIAN	Env Sci		07 JIMENEZ, MOISES	GIS
06 SEVERO, ANTHONY	Env Geo		07 TARON, ZACHARY	Hum Geo
06 SHEPARD, BRIAN	Hum Geo			
06 WINCHELL, DAVID	Env Eng		Company F1	
07 ALLISON, JOHN	Hum Geo		06 KRUGER, JARED	GIS
			06 MCNAIR, SARAH	Hum Geo
Company B1			06 MURPHY, JACOB	Env Geo
06 CANADY, CHEFFREN	GIS		06 PITTMAN, CODY	Env Geo
06 HOLLIS, JAMES	Hum Geo		06 WONG, ELLIOTT	Env Eng
06 SONG, JASON	Hum Geo		07 BAUDER, ANDREW	Hum Geo
07 BRADY, DANIEL	Hum Geo		07 BROWN, FRANCIS	Hum Geo
07 SALAZAR, EDUARDO	Hum Geo		07 DANIELS, SCOTT	Env Eng
			07 KRAUT, FRANK	Hum Geo
Company C1			07 SMITH, BRENT	Hum Geo
06 AVGERAKIS, STEPHANIE	Hum Geo			
06 BRADY, JACOB	Hum Geo		Company G1	
06 COONEY, SELINA	Env Eng		06 AMLIE, DEREK	Env Eng
06 GUERDAN, PETER	Env Eng		06 KIM, MICHELLE	Hum Geo
06 LOUDEN, JOYCE-CHARISSE	Hum Geo		06 KING, VALTON	Env Eng
06 O'SULLIVAN, IAN	GIS		06 SWEENEY, SCOTT	Env Eng
07 PIZZA, CELESTE	Hum Geo		07 FAW, BENJAMIN	GIS
07 STRATMAN, JEREMY	GIS		07 FISHER, RYAN	Env Eng
07 TAYLOR, BRANDON	GIS			
			Company H1	
Company D1			06 DAIL, MICHAEL	GIS
06 BIGELOW, ANDREW	Env Eng		07 HAWKINS, BLAKE	Env Eng
06 COLON, SADDIE	Env Geo		07 LOVINER, RYAN	GIS
06 HAUG, JUSTIN	GIS		07 MAIN, ANDREW	Hum Geo
06 SHAW, NICHOLAS	GIS			
07 MIRALDI, JACOB	Hum Geo			
07 SALDANA, ABRAHAM	GIS			
07 SCHUBERT, ELIZABETH	Hum Geo			



SECOND REGIMENT MAJORS

Company A2		Company E2	
06 LAWSON, JAMES	GIS	06 MAGNANI, ASHLEY	Hum Geo
07 FEELEY, MARY	Env Eng	06 MOFFATT, PHILIP	Env Eng
Company B2		Company G2	
06 HOOD, KAROLINE	Env Eng	06 CACOSSA, PETER	Hum Geo
07 BENNION, JOHN	GIS	07 BOTA, STEVEN	Env Eng
Company C2		07 FREHULFER, DAVID	GIS
06 DAVIES, ADAM	Hum Geo	07 LAWTON, JEANIAE	Hum Geo
06 HOLLER, ANDREW	Env Sci	Company H2	
06 LAKEY, JAMES	Env Eng	06 HIX, JOSEPHINE	Env Eng
06 ROSSI, SAMANTHA	Hum Geo	06 MCCARTHY, PATRICK	Env Eng
07 BOLTZ, TRAVIS	Env Eng	06 MITCHELL, PATRICK	Hum Geo
Company D2		06 NOWICKI, CELIA	Env Eng
06 FAN, MUN POH	Env Eng	07 IMBRIACO, JOSEPH	Hum Geo
06 HITZEROTH, MATTHEW	Env Eng	07 KELSO, JUSTIN	GIS
06 ITEN, CHRISTIAN	Hum Geo	07 LADNER, BRITTANY	Hum Geo
07 CURRAN, BRYAN	Hum Geo	07 VARGAS, MATTHEW	Hum Geo



Cadets from the Department enjoy a little home cooking.

THIRD REGIMENT MAJORS

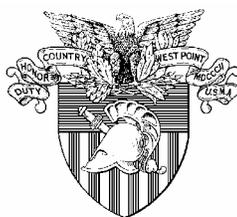
Company A3			Company E3	
06 EWENS, OAKEN	Hum Geo		06 HENRY, ANDREW	Env Geo
07 KRAUSE, JOSHUA	Env Eng		06 LINDERMAN, EHREN	Env Sci
			07 RUIZ, NEIL	Hum Geo
			07 SORRENTINO, JENNIFER	Env Eng
Company B3			Company F3	
06 FOX, ALEXANDER	GIS		06 CLAMON, DAVID	Hum Geo
06 KENT, ELIZABETH	Env Sci		06 NUSSDORFER, NICHOLAS	Env Eng
06 LEE, MELINA	Env Sci		06 ZIMMERMAN, SCOTT	Env Sci
06 LYNES, MATTHEW	Env Geo		07 LE, DIANNA	Env Sci
07 DULLANO, PATRICK	Hum Geo			
07 NEUMANN, ERIN	Hum Geo		Company G3	
07 SANDERS, CONNOR	Hum Geo		06 SMITH, ROBERT	GIS
07 STEPHENS, MICHAEL	Env Sci		07 KAISER, HEATHER	Hum Geo
Company C3			Company H3	
07 GONTARZ, NATHAN	Hum Geo		06 SIMPSON, PATRICK	Hum Geo
07 KLABEN, SARAH	Hum Geo		06 SPRAGUE, JUSTIN	Env Eng
			07 AOYAGI, STEVEN	Env Eng
Company D3				
06 ANDERSON, JONATHAN	Hum Geo			
06 BAUER, AMY	Env Eng			
06 BIER, PETER	Env Sci			
06 BOSWELL, TIMOTHY	Hum Geo			
06 WILLIAMS, MICHAEL	Env Eng			
07 GANGARAM, GERALD	GIS			
07 GLOWACKI, TARI	Hum Geo			



A cadet collects field data for analysis using one of the many instruments in our environmental laboratories during his Independent Study project

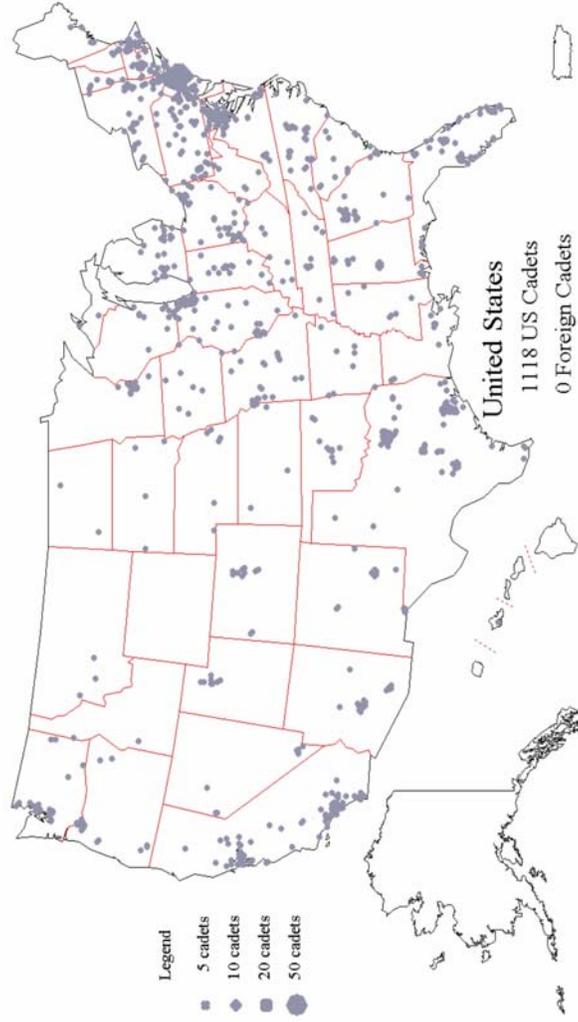
FOURTH REGIMENT MAJORS

Company A4			Company E4	
06 CAHILL, NATALIE	Env Sci	06 BAE, ME HAE	Env Sci	
06 CHABALKO, JUSTIN	GIS	06 SCHARDT, MATTHEW	Hum Geo	
06 HORSFALL, ANDREW	Hum Geo	06 WALSH, JASON	Hum Geo	
06 JOHNSON, MARCUS	GIS	07 BENDER, ROBERT	Env Eng	
07 BRUNING, INGRID	Hum Geo	07 LICHTY, JENNIFER	Env Eng	
07 PUNTENNEY, JAMES	Env Eng			
07 WOERTH, BRANDON	Env Eng	Company F4		
		06 HARTLEBEN, BRANDON	Env Sci	
Company B4		06 KNEPP, NICHOLAS	Env Sci	
06 ANDERSON, JUSTIN	Env Eng	06 LINTON, MATTHEW	Env Geo	
06 CALLAWAY, DOUGLAS	GIS	06 MANTEUFEL, LESLIE	Env Sci	
07 MARTINEZ, ERICK	Env Eng	07 CONWAY, JAMES	Env Eng	
07 SHAFER, JAMES	Env Eng	07 GOOD, MICHAEL	GIS	
		07 MAPLES, SEAN	Hum Geo	
Company C4		07 PETERSON, JOSE	GIS	
06 ANGWIN, KEITH	GIS	07 THOMPSON, BENJAMIN	Env Sci	
06 BALLARTA, DASHIELL	Hum Geo			
06 BISHOP, LINDSEY	Hum Geo	Company G4		
06 GRUTZMACHER, CHARLES	Env Sci	06 BANDI, LUKE	Hum Geo	
06 HOLLAND, TIMOTHY	Env Eng	06 CHERESKIN, BRETT	Env Geo	
06 RADUNZEL, JOEL	Hum Geo	07 ACOSTA, MATTHEW	Env Sci	
06 WALLS, ANNA	Hum Geo	07 BLOCK, JOSEPH	Env Eng	
07 GIRDANO, MICHAEL	GIS	07 DUESTER, TANJA	GIS	
07 KIVLEHAN, ANTHONY	Env Eng	07 SULLIVAN, DANIEL	Env Sci	
07 MORGAN, ANDREW	GIS			
		Company H4		
Company D4		06 AGNEW, JEFFREY	Hum Geo	
06 GRANT, MICHAEL	Hum Geo	06 BLACKBURN, JAMES	Hum Geo	
06 PRIDE, MATTHEW	Env Geo	06 YAKULIS, ANDREW	GIS	
06 TITUS, JUSTIN	Env Geo	07 BRAUD, DANIEL	Hum Geo	
07 CHASTEN, RANDALL	Hum Geo			
07 IVANOV, ILYA	GIS			
07 VASS, NATHANIEL	Env Sci			
07 WILSON, TRACY	Env Eng			



The United States Military Academy, West Point, New York

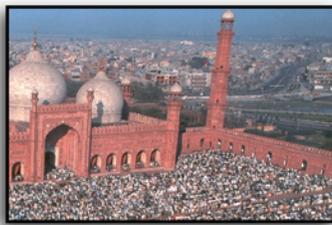
Class of 2008 Hometown Map - "No Mission Too Great, '08"



- Legend
- 5 cadets
 - 10 cadets
 - 20 cadets
 - 50 cadets

Created by COL Scott A. Loomer, Geographic Sciences Laboratory

Data from the Office of the Dean prepared by LTC Mike Hennricks



Department of Geography and Environmental Engineering



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