This course is designed to provide graduate engineering students and others with sufficient background in the emerging field of environmental security (including identification of environmental security problems, tools for prevention of breaches in environmental security, and response to such breaches) to allow the students to understand the issues and perform at the entry level of environmental security positions in government or in the private sector. No formal prerequisites. It is assumed that students have had a basic engineering or science curriculum as an undergraduate. Ability to read and understand technical writing is required. 3 hours of credit. Grading: Midterm (20%); Paper (25%); Final Exam (45%); Effective class participation (10%)

Textbook: "Nuclear Terrorism," Times Books by Graham Allison (2005) and Various Handouts Provided by Professor

Session 1 Introduction to the Study of Environmental Security  
Thursday August 30, 2012
1. Introductions and Background of the Students.
3. Definitions of Environmental Security, Terrorism and what will be covered in course.
4. Environmental Security: Problem Identification, Prevention, and Response
5. Public and private Sector Roles: preventing access, controlling information, and recent examples of breaches in environmental security, damage, responses.
6. Can law, expenditures, and infrastructure make our environment secure?

Sessions 2, 3 & 4 Environmental Dispersion of Radiological Contaminants  
Thursdays Sept.6,13 & 20, 2012  
Readings from "Nuclear Terrorism" 
Graham Allison and Handouts

Case Study Number 1: Securing Nuclear Materials: Environmental Security Priority 1
1. Fundamentals of Radiological Contaminants
2. Weapons: Real Bombs and Dirty Bomb threats
3. Nuclear Power Plants and Spent Fuel
4. Nuclear Waste and the Yucca Mountain Solution
5. Applying the fundamentals of Prevention, Mitigation, Response, and Remediation to nuclear environmental threats
6. Chernobyl and beyond

Sessions 5-6 Securing Environmental Infrastructure from Attack  
Thursdays Sept. 27, Oct. 4  
Readings: Water Sector Security Handouts

Case Study Number 2: Environmental Security of Water Supply, Dams, Levees, Harbors
1. Mock Vulnerability Assessment for Small Groundwater Facility and Large metro system
2. Safe Drinking Water Act Amendments and Technology Forcing Laws
3. Introduction in the role and effectiveness of environmental security regulation
4. What is the greatest contaminant threat to our drinking water and is it credible; what is the greatest structural threat to water infrastructure and is it credible?

Class Exercise: *Water Infrastructure Security: Prevention, Mitigation, and Response*
1. "Intentional Katrina" and levee safety in America. Compare and contrast risk to Nation's Water supply.
2. Dam Safety and Terrorism. Control of threats through design basis engineering
3. Harbor and Waterways Security

Sessions 7-8
Thursday October 11 and 18, 2012 *Introduction to Chemical and Bioterrorism*
Reading: Handouts Ch. 5 and 7

1. Threats, preventive measures, and responses to Chemical threats and Bioterrorism
2. Industrial sources of Chemical Threats from terrorism
3. Prevention in the Private and Commercial Sectors
4. Biological Terrorism

Session 9
Thursday Oct. 25, 2012 Midterm (20% of Grade)

Papers Due Nov 1, 2012 (30% of Grade)

Session 10-11
Thursday Nov. 1 & 8, 2012 *Lessons in Responding to Environmental Releases from Defense Cleanup programs--DERP, FUDS, FUSRAP,CERCLA*
Readings: Handouts

1. Nuclear, biological, and chemical weapons materials
2. Safe storage and prevention of access
3. Chemical Demilitarization programs and non-proliferation
4. Damage from environmental dispersion and Response actions

Sessions 12-13
Thursday November 15, 29 No class on Thanksgiving *Immediate Emergency Responses and long term prevention of breaches of Environmental Security: Lessons from 9/11/2001, Kuwait Oil fires, Hurricane Katrina*
Readings: Chapters 2, and Handouts

1. The record on response actions to date and lessons learned
2. Cyber-security and the role of intelligence gathering in Preventing Breaches of Environmental Security
3. Infrastructure and Engineered methods for preventing environmental terrorism
4. Evaluation of technical, legal, and political efforts to Prevent Breaches of Environmental Security

Session 14 Review December 6, 2012 FINAL EXAM to Be Announced
Administrative Information and Academic Integrity

1. Emergency information

What to do if the instructor does not arrive:
If the Instructor does not arrive for the class at the designated starting time and has not notified
the class of a late starting time or the cancellation of the class, the students should wait in the
classroom for at least 30 minutes before departing. One member of the class will be selected to
notify the EMSE Department of the Instructor’s absence by calling the EMSE Department at 202-
994-7541 on the next business day.

What to do in the case of an emergency:

- All students should familiarize themselves with the emergency evacuation routes from the
classroom that the course is being taught in. Pay particular attention to understanding how to
egress if all power is out and there is no light.
- In the event of an emergency evacuation of the class building, the students are to assemble at the
intersection of 18th and F Street on the northwest side. If, due to the emergency, that site is
unavailable, assemble at the intersection of 19th and F on the northwest side.

General emergency preparedness information:

- GW Campus Advisories. Students should check the GW Campus Advisories Web Site at:
http://www.campusadvisories.gwu.edu/index.cfm for current information related to campus
conditions, closures, safety information and any other information concerning events that may
disrupt normal operations.
- GW Alert. All students, faculty and staff registered in the GW banner system GW will receive
emergency alerts, notifications and updates sent directly to their GW email address. If
individuals elect to receive these alerts on a mobile device they may log on to GWeb Information
Web Site at https://banweb.gwu.edu and update their contact information to include mobile
devices.

Academic integrity:
Academic integrity is central to the learning and teaching process. Students are expected to conduct
themselves in a manner that will contribute to the maintenance of academic integrity by making all
reasonable efforts to prevent the occurrence of academic dishonesty. Academic dishonesty includes, but is
not limited to, obtaining or giving aid on an examination, having unauthorized prior knowledge of an
examination, doing work for another student, and plagiarism of all types.

The number one problem that students run into with regards to academic integrity is plagiarism. It is not
okay to copy, use, or otherwise exploit other people’s ideas, words, or creations without giving them
credit in the proper form. Sometimes this means you must use quotation marks, while other times a
simple source citation will do the trick. Changing a few words in a paraphrase is not enough to turn
source material into “your own words” – in fact, that’s a really bad idea to even try. Changing the
phrasing order of sentences is not okay and using the thesaurus to find ways to change “happy” to “glad”
is also a very bad idea.

It is expected that students know how to correctly quote and cite material, and also how to write well.
This is a doctoral level course and students will be held to the high standards associated with this level of
education. For those students who need assistance, the GWU Writing Center is available. See
http://www.gwu.edu/~gwriter/.
There is no such thing as “boilerplate” or “standard language” in academia. Students are expected to write their reports themselves, using their own language and their own formulation. If it is necessary to use material from other sources, it is expected (and mandatory) that the standards of academic style and integrity will be followed. This includes glossaries and appendices. For additional information see The George Washington University Code of Academic Integrity [http://www.gwu.edu/~ntegrity/](http://www.gwu.edu/~ntegrity/)