

**The George Washington University**  
Department of Engineering Management and Systems Engineering  
EMSE 6220: Environmental Management

**Course Syllabus**

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Course Description

This course is designed to provide an overview of the environmental challenges currently facing humankind, as well as the technical, political, administrative and social forces influencing the quality of the environment and the use of resources. It includes coverage of government and industrial programs to combat pollution of the air, soil and water, and the legislative and regulatory regimes affecting environmental and related energy matters.

Learning Outcomes

Upon completing this course, students should have solid knowledge about the drivers of macroscale and environmental problems throughout the world, the nature of such problems, and the responses that have evolved to address such problems. In addition, students will have specific knowledge about the nature and solutions to problems in the areas of air quality, water quality, biodiversity and hazardous and solid wastes.

Time Estimates

The amount of time expected for optimal performance in this course in 150 minutes (2.5 hours) direct interaction (class time) plus 300 minutes (5 hours) of independent learning (homework) per week during the course.

Grading

Case studies	10%
Mid-term exam	30%
Course project	25%
Final exam	30%
Class participation	5%

Notifications

A notification roster will appear on the class web site and will be used to alert each class member if the class is cancelled due to inclement weather or other reasons. If you are uncertain about class cancellation at any time, please call me. If I fail to arrive for the class at the designated starting time and have not notified the class of a late starting time or cancellation, students should wait in the classroom for at least 30 minutes before departing.

## SCHEDULE AND ASSIGNMENTS

<u>Session</u>	<u>Topics</u>	<u>Assignments</u>
1 Aug 27	<u>The Environment We Are Trying to Protect: Ecology and Ecosystems.</u> Class Introductions; Course Requirements; Terrestrial Ecosystems; Aquatic Ecosystems; Textbook Overviews	Ref 4, pages 3-51
2 Sep 3	<u>Drivers of Environmental Problems I.</u> Population and Economic Growth; Industrialization; Urbanization	Ref 1, pages 3-16 Turn in: Project Proposals
3 Sep 10	<u>Drivers of Environmental Problems II.</u> Evolution of Energy Use; Exponential Growth; Future Predictions <u>Case Study: Africa</u>	Ref 1, pages 21-51
4 Sep 17	<u>Nature of Environmental Problems.</u> Natural and Anthropogenic Environmental Problems <u>Case Study: Asia and the Pacific</u>	Ref 2, pages 19-33
5 Sep 24	<u>Global Responses.</u> New and Emerging Environmental Management Disciplines; Multinational Agreements <u>Case Study: Europe</u>	Ref 1, pages 471-481 & 581-617
6 Oct 1	<u>Presentations.</u> Project Progress Report Presentations; Review for Mid-Term Examination	
7 Oct 8	<u>Mid-Term Examination</u>	
8 Oct 15	<u>Air Quality Management I.</u> Review of Mid-term Exam Results; Atmospheric Pollutants and Effects; Overview of Laws and Regulations	Ref 1, pages 107-133
9 Oct 22	<u>Air Quality Management II.</u> Air Pollution Measurement and Control <u>Case Study: Latin America and the Caribbean</u>	Ref 2, pages 71-138 Ref 3, pages 24-35 and 122-131
10 Oct 29	<u>Water Quality Management I.</u> History of Water Pollution; Classification of Waterborne Pollutants; Sources of Water Pollution <u>Case Study: North America</u>	Ref 1, pages 235-264 Ref 2, pages 207-272
Nov 5	<u>No class (election day)</u>	

11 Nov 12	<u>Water Quality Management II and Biodiversity.</u> Water and Wastewater Treatment Technologies; Regulatory Approaches to Water Quality Management; Status and Trends of Species Diversity Case Study: West Asia	Ref 1, pages 141-167 Ref 2, pages 155-205
12 Nov 19	<u>Solid and Hazardous Waste Management.</u> History of Solid Waste; Statutory and Regulatory Overview; Approaches to Solid Waste Disposal; History of Hazardous Waste; Major Legislation; Approaches to Hazardous Waste Treatment, Storage and Disposal; Integrated Discussion of Environmental Impacts on Human Health	Ref 1, pages 201-228 Ref 2, 275-332
Nov 26	<u>Thanksgiving Break</u> - no class	
13 Dec 3	<u>Presentations and Review.</u> Project Final Report Presentations	
14 Dec 10	<u>Presentations and Review.</u> Project Final Report Presentations; Review for Final Examination	Turn in: Project Final Reports
15 Dec 17	<u>Final Examination</u>	

Course Zoom site (if needed):

- <https://zoom.us/j/7982244321?pwd=c1BHdGQzcjZyOEZ2VGVSQWp6N3Q0QT09>
- Alternate call-in number +1-301-715-8592; Personal Meeting ID 798 224 4321;
- Passcode 073561

## Textbooks

1. United Nations Environmental Programme. Global Environmental Outlook 6 (GEO-6), Healthy People, Healthy Environment. New York: UNEP, 2019. (ISBN 978-1108707664), 745 pages. Available free in pdf format on course website or online at: <https://www.unenvironment.org/resources/global-environment-outlook-6>
2. Organisation for Economic Co-operation and Development. OECD Environmental Outlook to 2050. Paris: OECD, 2012. (ISBN 978-92-64-12216-1), 353 pages. Available free in pdf format on course website.
3. UNEP, UNDP, World Bank, World Resources Institute. Decision Making in a Changing Climate. Washington, DC: World Resources Institute, 2011. (ISBN 978-1-56973-774-3), 170 pages. Available free in pdf format on course website or online at: <http://www.wri.org/publication/world-resources-report-2010-2011>
4. UNEP, UNDP, World Bank, World Resources Institute. World Resources 2000-2001. Washington, DC: World Resources Institute, 2001. (ISBN 1-56973-443-7), 389 pages. Available free in pdf format on course website or online at: <http://www.wri.org/publication/world-resources-2000-2001>

## **University Policies**

Academic Integrity Code. Academic integrity is an essential part of the educational process, and all members of the GW community take these matters very seriously. As the instructor of record for this course, my role is to provide clear expectations and uphold them in all assessments. Violations of academic integrity occur when students fail to cite research sources properly, engage in unauthorized collaboration, falsify data, and otherwise violate the Code of Academic Integrity. If you have any questions about whether particular academic practices or resources are permitted, you should ask me for clarification. If you are reported for an academic integrity violation, you should contact you should contact Conflict Education and Student Accountability (CESA), formerly known as Student Rights and Responsibilities (SRR), to learn more about your rights and options in the process. Consequences can range from failure of assignment to expulsion from the University and may include a transcript notation. For more information, refer to the SRR website at [studentconduct.gwu.edu/academic-integrity](http://studentconduct.gwu.edu/academic-integrity), email [rights@gwu.edu](mailto:rights@gwu.edu), or call 202-994-6757.

Use of Electronic Course Materials and Class Recordings. Students are encouraged to use electronic course materials, including recorded class sessions, for private personal use in connection with their academic program of study. Electronic course materials and recorded class sessions should not be shared or used for non-course related purposes unless express permission has been granted by the instructor. Students who impermissibly share any electronic course materials are subject to discipline under the Student Code of Conduct. Contact the instructor if you have questions regarding what constitutes permissible or impermissible use of electronic course materials and/or recorded class sessions. Contact Disability Support Services at [disabilitysupport.gwu.edu](http://disabilitysupport.gwu.edu) if you have questions or need assistance in accessing electronic course materials.

University Policy on Religious Holidays. Students must notify faculty during the first week of the semester in which they are enrolled in the course, or as early as possible, but no later than three weeks prior to the absence, of their intention to be absent from class on their day(s) of religious observance. If the holiday falls within the first three weeks of class, the student must

inform faculty in the first week of the semester. For details and policy, see <https://provost.gwu.edu/policies-procedures-and-guidelines>.

Academic Commons. Academic Commons is the central location for academic support resources for GW students. To schedule a peer tutoring session for a variety of courses visit [go.gwu.edu/tutoring](http://go.gwu.edu/tutoring). Visit [academiccommons.gwu.edu](http://academiccommons.gwu.edu) for study skills tips, finding help with research, and connecting with other campus resources. For questions email [academiccommons@gwu.edu](mailto:academiccommons@gwu.edu).

GW Writing Center. GW Writing Center cultivates confident writers in the University community by facilitating collaborative, critical, and inclusive conversations at all stages of the writing process. Working alongside peer mentors, writers develop strategies to write independently in academic and public settings. Appointments can be booked online at <https://gwu.mywconline>.

Disability Support Services. Any student who may need an accommodation based on the potential impact of a disability should contact Disability Support Services (DSS) at 202-994-8250 or <https://disabilitysupport.gwu.edu> to establish eligibility and to coordinate reasonable accommodations.

Student Health Center. The Student Health Center (SHC) offers medical, counseling / psychological, and psychiatric services to GW students. More information about the SHC is available at 202-994-5300, 24/7 or <https://healthcenter.gwu.edu>. Students experiencing a medical or mental health emergency on campus should contact GW Emergency Services at 202-994-6111, or off campus at 911.

GW Campus Emergency Information. GW Emergency Services: 202-994-6111. For situation-specific instructions, refer to GW's Emergency Procedures guide.

GW Alert. GW Alert is an emergency notification system that sends alerts to the GW community. GW requests students, faculty, and staff maintain current contact information by logging on to [alert.gwu.edu](http://alert.gwu.edu). Alerts are sent via email, text, social media, and other means, including the Guardian app. The Guardian app is a safety app that allows you to communicate quickly with GW Emergency Services, 911, and other resources. Learn more at <https://safety.gwu.edu>.

Protective Actions. GW prescribes four protective actions that can be issued by university officials depending on the type of emergency. All GW community members are expected to follow directions according to the specified protective action. The protective actions are Shelter, Evacuate, Secure, and Lockdown (details below). Learn more at <https://safety.gwu.edu/gw-standard-emergency-statuses>.

#### Shelter

- Protection from a specific hazard
- The hazard could be a tornado, earthquake, hazardous material spill, or other environmental emergency.
- Specific safety guidance will be shared on a case-by-case basis.

#### Action:

- Follow safety guidance for the hazard.

#### Evacuate

- Need to move people from one location to another.

- Students and staff should be prepared to follow specific instructions given by first responders and University officials.

Action:

- Evacuate to a designated location.
- Leave belongings behind.
- Follow additional instructions from first responders.

### Secure

- Threat or hazard outside of buildings or around campus.
- Increased security, secured building perimeter, increased situational awareness, and restricted access to entry doors.

Action:

- Go inside and stay inside.
- Activities inside may continue.

### Lockdown

- Threat or hazard with the potential to impact individuals inside buildings.
- Room-based protocol that requires locking interior doors, turning off lights, and staying out of sight of corridor window.

Action:

- Locks, lights, out of sight
- Consider Run, Hide, Fight
- Classroom emergency lockdown buttons

Some classrooms have been equipped with classroom emergency lockdown buttons. If the button is pushed, GWorld Card access to the room will be disabled, and GW Dispatch will be alerted. The door must be manually closed if it is not closed when the button is pushed. Anyone in the classroom will be able to exit, but no one will be able to get in.