

The George Washington University
Department of Engineering Management and Systems Engineering
Environmental and Energy Management Concentration
EMSE 6245: Analytical Tools in Environmental Management
COURSE SYLLABUS

Mondays, 3:30 pm – 6:00 pm

Room 335, Lisner Hall

Course web page: <http://blackboard.gwu.edu>

Deason page: <https://eemi.seas.gwu.edu/jonathan-deason>

EMSE website: <https://www.emse.seas.gwu.edu/>

EMSE LinkedIn: <https://www.linkedin.com/in/emse seas/>

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Course Description

This is a survey course in environmental management focusing on widely used tools for assessing impacts on environmental resources. It covers both quantitative and qualitative environmental management tools, including both generic and domain-specific tools. Quantitative environmental assessment tools covered include quantitative risk assessment, environmental valuation methods, and multiobjective decision making methods. Qualitative analytical tools include those used for wetlands and endangered species protection. In addition, Congressional and Executive Branch processes as they relate to environmental management are discussed.

Learning Outcomes

At the end of this course:

- Students should be able to understand the theoretical underpinnings of quantitative risk assessment and practical applications in the areas of human and ecological health
- Students should be able to understand the theoretical underpinnings and practical applications of 13 environmental valuation methods
- Students should be able to understand theoretical underpinnings and practical applications multicriteria decision making methods as applied to the environmental decision making
- Students should have operational knowledge of wetlands protection tools, including wetlands delineation, evaluation, mitigation and monitoring
- Students should have operational knowledge of endangered protection tools, including biological assessments, biological opinions and consultation process, and habitat conservation planning

Time Estimates

The amount of time expected for optimal performance in this course is 150 minutes (2.5 hours) of direct interaction (class time) plus 360 minutes (6 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%

Class Logistics

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 are welcome to call me at 703-346-0114.

Course Access

Our normal meeting room is Room 335, Lisner Hall. If we have to go virtual due to inclement weather or other reasons, we will use Zoom. To connect, go to <https://zoom.us/j/7982244321?pwd=c1BHdGQzcjZyOEZ2VGVSQWp6N3Q0QT09>. You also can call the alternate call-in number +1-301-715-8592 (Washington DC), Meeting ID 798 224 4321, Meeting Password 073561 by phone for audio only. If for any reason you become disconnected during the semester, please try to reconnect using the Zoom link above. If that doesn't work, just call the alternate call-in number and rejoin that way.

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 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, email rights@gwu.edu, or call 202-994-6757.

University Policy on Religious Holidays

In accordance with University Policy, students should notify faculty during the first week of the semester of their intention to be absent from class on their day(s) of religious observance. Faculty should extend to these students the courtesy of absence without penalty.

Support for Students Outside the Classroom: Disability Support Services (DSS):

Any student who may need accommodation based on the potential impact of a disability should contact the Disability Support Services office at 202-994-8250 in Rome Hall, Suite 102, to establish eligibility and to coordinate reasonable accommodations.

Mental Health Services

The University's Mental Health Services offers assistance and referral to address students' personal, social, career, and study skills problems. Services for students include crisis and emergency mental health consultations, confidential assessments, counseling services (individual and small group), and referrals. For more information, call Colonial Health Services: 202-994-5300.

GW Campus Emergency Information

- 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. 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 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. Learn more at safety.gwu.edu/gw-standard-emergency-statuses.
- GW Emergency Services: Telephone 202-994-6111; for situation-specific instructions, refer to [GW's Emergency Procedures guide](#)

SCHEDULE AND ASSIGNMENTS

<u>Session</u>	<u>Topics</u>	<u>Assignments</u>
1 Jan 22	<u>Introduction to Environmental Analytical Tools.</u> Introductions, course requirements and overview, Federal environmental processes	
2 Jan 29	<u>Quantitative Risk Assessment (1).</u> Nature of risk; uses of risk assessment; risk assessment framework; types of risk; perceptions of risk	
3 Feb 5	<u>Quantitative Risk Assessment (2).</u> Risk Assessment Case Study: Kesterson National Wildlife Refuge	Turn in project proposals
4 Feb 12	<u>Environmental Valuation Methods (1).</u> The role of monetary valuation in environmental management; overview of applications-relationship with cost-benefit analyses, natural resource damage assessment, environmental impact assessment, Section 4(f) analyses, Principles and Guidelines	
Feb 19	<u>Presidents' Day</u> (no class)	
5 Feb 26	<u>Environmental Valuation Methods (2).</u> Market Value Approaches; Travel Cost Method; Contingent Valuation; Replacement Cost Approach	
6 Mar 4	<u>Multi Criteria Decision Making.</u> MCDM taxonomies; <i>a priori</i> methods; <i>a posteriori</i> methods; hybrid methods; case study example	
Mar 11	<u>Spring Break</u> (no class)	
7 Mar 18	<u>Presentations and Review.</u> Project Progress Report Presentations; Review for Mid-term Examination	Progress report presentations

8 Mar 25	<u>Mid-Term Examination</u>	
9 Apr 1	<u>Wetlands Protection Tools (1)</u> . Wetlands overview; wetlands jurisdiction, permitting, enforcement, mitigation and monitoring	
10 Apr 8	<u>Wetlands Protection Tools (2)</u> . Wetlands delineation procedures; Federal wetland programs	
11 Apr 15	<u>Endangered Species Protection Tools (1)</u> . Overview of ESA; Section 7 consultation process and Habitat Conservation Plans	
12 Apr 22	<u>Endangered Species Protection Tools (2)</u> . Biological assessments and biological opinions; Case Study: Daniels Parkway, Florida	
13 Apr 29	<u>Endangered Species Protection Tools (3)</u> . Habitat Conservation Plans; Case Study: Placer County Conservation Program, California	
14 May 1 (Wednesday)	<u>Presentations and Review</u> . Project Final Report Presentations; Review for Final Examination	Turn in: Project Final Reports
15 May 6	<u>Final Examination</u>	