

THE GEORGE WASHINGTON UNIVERSITY  
Environmental and Energy Management Program  
EMSE 6235: Water Quality Management

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Mondays, 6:10 PM – 8:40 PM  
Remote Instruction  
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Web Sites

Course Web Page: <http://blackboard.gwu.edu>  
E&EM Web Page: <https://eem.seas.gwu.edu>  
E&EM Newsletter: <https://eem.seas.gwu.edu/newsletter>  
E&EM Institute: <https://eemi.seas.gwu.edu>  
Deason Web Page: <http://www.seas.gwu.edu/~jdeason>

Course Description

With dramatic increases in urban density and industrialization since World War II has come intensive pressure on the quality of surface and ground water resources in the United States and around the world. Modern approaches to water quality protection began in the United States with the passage of what is now known as the Clean Water Act in the mid-nineteen seventies. Since that time, a continually increasing level of attention has been directed to protecting the quality of the Nation's water resources from a wide variety of point and non-point sources of pollution. With Clean Water Act reauthorization deliberations underway in the Congress, attention to water quality problems across the country undoubtedly will increase even further.

Learning Outcomes

Upon completing this course, students should have solid knowledge about the nature of point and non-point sources of surface and ground water pollution and the statutory, regulatory and institutional framework controlling water quality management activities in the U.S. learning outcomes also include understanding of current approaches to water quality protection and enhancement and the role of engineered treatment processes in water quality management. Specific topics covered in the course include identification of sources and types of water pollution, statutory and regulatory approaches to water quality management, water quality standards and criteria, the National Pollutant Discharge Elimination System, water supply and wastewater treatment processes and non-point source pollution control.

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%

Textbook

Vigil, Kenneth M. Clean Water. Corvallis, Oregon: Oregon State University Press, 2<sup>nd</sup> edition. ISBN 0-87071-498-8.

### Notifications

I will alert each class member through the Blackboard message system 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.

### Emergency Preparedness

Please familiarize yourself with the emergency evacuation routes from our classroom and sign up for GW Alert text-message or e-mail notifications at <http://campusadvisories.gwu.edu/gw-alert-faqs>. For up-to-date information on the GWU emergency preparedness and response resources, please check: <http://campusadvisories.gwu.edu/About-Office-Emergency-Management>

### Students with Disabilities

Any student who may need an accommodation based on the potential impact of a disability should contact the Disability Support Services office at 202-994-8250 in the Marvin Center, Suite 242, to establish eligibility and to coordinate reasonable accommodations. For additional information please refer to: <https://disabilitysupport.gwu.edu/>

### Academic Integrity

Students are encouraged to share their opinions during the course formal meetings and outside of the class, as well as discuss the principles and applications of the course materials, to the extent these intellectual exchanges and academic collaborations comply with the GWU Code of Academic Integrity: <https://studentconduct.gwu.edu/code-academic-integrity>. Violations of the University's Code of Academic Integrity will not be tolerated and will be dealt with according to the George Washington University policies and procedures. By registering for this course you agree to comply with the GWU Code of Academic Integrity. Academic dishonesty includes, but is not limited to: obtaining or giving aid on an examination, having unauthorized prior knowledge of examination content, doing assignments on behalf of another student, and plagiarism of all types. Please familiarize yourself with the GWU Code of Academic Integrity and feel free to ask and clarify beforehand if you are unsure whether a specific rule applies to your situation. There will be no repercussions for prior clarifications.

## SCHEDULE AND ASSIGNMENTS

<u>Session</u>	<u>Topics</u>	<u>Assignments</u>
1 Aug 31	<u>Introduction to Water Quality Management.</u> Introductions; Discussion of Course Requirements; Overview of Water Quality Management; Components of Hydrologic Systems	Read Introduction and Chapter 1 (The Hydrologic Cycle)
Sep 7	Labor Day (no class)	
2 Sep 14	<u>Status and Trends of Water Quality.</u> Surface Water; Ground Water; Drinking Water	Read Chapter 2 (Water Chemistry and Microbiology) Turn in: project proposals
3 Sep 21	<u>Sources and Effects of Water Pollution I.</u> History of Water Pollution; Toxic Metals and Other Inorganic Pollutants; Organic Pollutants	Read Chapter 3 (Sources of Water Pollution)
4 Sep 28	<u>Sources and Effects of Water Pollution II.</u> Nutrients; Microorganisms; Thermal Effects	“
5 Oct 5	<u>Sources and Effects of Water Pollution III.</u> Atmospheric Deposition of Surface Water Pollutants; Irrigation-Induced Contamination and Other Non-Point Source Water Pollutants	“
6 Oct 12	<u>Presentations and Review.</u> Project Progress Report Presentations; Review for Mid-Term Examination	
7 Oct 19	<u>Mid-Term Examination</u>	
Oct 26	<u>Water Quality Surveillance.</u> Water Quality Monitoring and Modeling	
9 Nov 2	<u>Statutory and Regulatory Approaches to Water Quality Management I.</u> Clean Water Act	Read Chapter 5 (Water Quality Regulations)

10 Nov 9	<u>Statutory and Regulatory Approaches to Water Quality Management II.</u> Safe Drinking Water Act; Other Statutory and Regulatory Provisions Pertaining to Water Quality Management	Read Chapter 6 (The Watershed Approach) and Chapter 7 (Drinking Water)
11 Nov 16	<u>Engineered Water Quality Control Measures I.</u> Sources of Water Supplies; Water Transmission; Physical and Chemical Treatment Processes for Water Supply	Read Chapter 4 (Preventing Water Pollution)
12 Nov 23	<u>Engineered Water Quality Control Measures II.</u> Wastewater Characteristics; Wastewater Collection Facilities; Wastewater Pretreatment; Primary, Secondary and Tertiary Treatment Technologies; Project Final Report Presentations	Read Chapter 8 (Getting Personal About Clean Water)
13 Nov 30	<u>Presentations and Review.</u> Project Final Report Presentations	
14 Dec 7	<u>Presentations and Review.</u> Project Final Report Presentations; Review for Final Examination	Turn in: Project Final Reports
15 Dec 14	<u>Final Examination.</u>	