

Fall 2014

Water Resources Engineering 2: Water Resource Systems - George Mason University

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CEIE 742

Water Resources Engineering 2: water resource systems

Syllabus

- Course Objectives** To introduce concepts, applications, and tools of systems analysis for water resources planning, management, and design.
- To apply these principles to problems including river basin planning, real-time hydrosystem operations, water quality management, capacity expansion, urban drainage network design, and sanitary sewer design.
- Class Time** Wednesday, 4:30 – 7:10 pm
Nguyen Engineering Building (ENGR), room 1108
- Texts** *Water Resource Systems Planning and Management: an introduction to methods, models and applications*, Daniel P. Loucks and Eelco van Beek, United Nations Educational, Scientific and Cultural Organization (UNESCO), 2005 (ISBN: 92-3-103998-9). The text is available for free downloading at: <http://ecommons.library.cornell.edu/handle/1813/2804>. Exercises that complement the text are available at: <http://ecommons.cornell.edu/handle/1813/2805>. A compendium of water facts is available at: <http://ecommons.cornell.edu/handle/1813/2808>. Finally, exercises using genetic algorithms are available at: <http://ecommons.cornell.edu/handle/1813/2807>. Copies of figures and tables are also available on Blackboard.
- Water Resources Systems Analysis through Case Studies: data and models for decision making*, David W. Watkins, Jr., editor, American Society of Civil Engineers, 2013 (ISBN: 978-0-7844-1287-9).
- Email** All email will be sent to addresses in the GMU domain exclusively. It is students' responsibility to monitor email to Mason email accounts.
- Honor Code** The [George Mason University Honor Code](#) is in effect for this course. Please consult the University catalog for a complete statement of the Honor Code, and see the instructor if you need further clarification.
- Writing** The [Writing Center](#) at George Mason University can be an invaluable resource to students. The Center offers many services to help you improve your writing. Please use the Center to ensure that your submissions are well written. Good writing is expected for all assignments; grades will be reduced for poor writing.
- University Services** There are numerous services provided by the university to support students. The Dean of Students Office (<http://deanofstudents.gmu.edu/>) is the central location for these services and DOS staff can address any question that you may have. Here is a short list of services that may be useful to you:
- Office of Disability Services: <http://ods.gmu.edu/>
 - Student Health Services: <http://shs.gmu.edu/>
 - Counseling and Psychological Services: <http://caps.gmu.edu/>
 - Career Services: <http://careers.gmu.edu/>

**Course
Conduct**

This course will be conducted as a seminar. Students will be expected to lead and participate in discussion in every class meeting. Everyone is expected to prepare for class by reading the appropriate materials prior to the class. Designated students will prepare to lead discussion, especially during the second half of the semester.

Project

Each student will be paired with another student and together the team will lead the discussion on one of the case studies described in the Case Studies text. Each team will be allocated one class meeting (150 minutes) for its presentation.

The requirements of the project are:

1. Research the case study assigned. This means reading the materials in the Case Studies text, downloading and reviewing all of the additional data and models provided, collecting and reading the literature cited and any other materials that are relevant.
2. Prepare a seminar presentation with your partner on your case study. You have 150 minutes for the presentation/discussion. You should prepare a Powerpoint file designed to support your presentation. This does not imply that you must lecture for 150 minutes using extensive Powerpoint slides. It does imply that the components of your presentation are included in the Powerpoint file. For example, suppose you want to lecture for 20 minutes about your case study, then pose several questions to stimulate discussion for 15 minutes, then run a group exercise for 20 minutes, then another lecture section, etc. Your Powerpoint file should contain relevant slides for the initial lecture, one or more slides describing the discussion questions, one or more slides describing the group exercise, relevant slides to support the next lecture section, etc.
3. Include a list of references at the end of your Powerpoint file.
4. The Powerpoint slides should conform to good practice. Here are several websites with guidance:
 - Top Ten, Evidence-Based Best Practices for Powerpoint in the Classroom (http://www.ronberk.com/articles/2012_best-practices.pdf)
 - Presenting with Powerpoint (<http://tep.uoregon.edu/technology/Powerpoint/docs/presenting.pdf>)
 - The ten most important things to teach your Powerpoint users (<http://www.techrepublic.com/blog/10things/the-10-most-important-things-to-teach-your-Powerpoint-users/2942>)
 - Microsoft Powerpoint: Best Practices (http://www.usna.edu/IDSC/_files/documents/Powerpoint_BestPractices.pdf)
5. Augment each slide in your Powerpoint file with a narrative that describes fully your message associated with the slide. This should be put in the notes section of the slide. For example, a slide may show a graph. In the notes section should be your story that explains to the audience what that graph is, what it means, and how it is relevant to the project. Another example would be a slide that lists three questions that you want addressed in classroom discussion for the next ten minutes. The notes section would contain a description of why these questions are important, how they are relevant to the overall project, and the key answers to each question. If the notes from all the slides were combined into a single document, interspersed with the graphs, tables, and

possibly some of the bullet lists on the slides, the resulting document should be the equivalent of a project paper. The requirement of fully annotating your Powerpoint presentation is in lieu of preparing a separate research paper for the project.

6. Lead class discussion for 150 minutes on the topic of your project. This may include a presentation, discussion, group or individual exercises, or other strategies that you think are relevant to help the class learn about your project area.
7. Submit via Blackboard, 24 hours prior to your presentation, the Powerpoint file that you intend to use during your in-class presentation. You should upload your Powerpoint file on Blackboard under “Assignments” and then “Project Presentation Files”.
8. No later than Nov 26, submit via Blackboard your final Powerpoint file containing not only the slides used during your in-class presentation but also the required narrative that complements each slide in the Notes section. This final, complete version of your Powerpoint file should be submitted on Blackboard under “Assignments” and then “Final Project File”.

Grades

Grades for the course are determined by student performance in class discussions and student presentations. The relative importance of each is:

Class Participation	25%
Project	75%

Schedule (Tentative)

This is a **tentative** schedule of classes.

Week	Date	Topic	Chapter	Discussion Leader
1	Aug 27	Introduction, modeling	1 – 3	Houck
2	Sep 3	Modeling methods, stochastic modeling	4 - 6	Houck
3	Sep 10	Uncertainty and risk	7 - 9	Houck
4	Sep 17	Performance criteria	10	Houck
5	Sep 24	River basin planning, design, operations	11	Houck
6	Oct 1	River basin planning, design, operations	11	Houck
7	Oct 8	River basin planning, design and operations	11	Houck
8	Oct 15	Planning a Water Supply System		2 students

		for the Village of Adi-Gheda, Eritrea	
9	Oct 22	Evaluating Storage Carryover in the Weber River Basin Using the Water Evaluation and Planning System	2 students
10	Oct 29	Combined Sewer Overflows in the Milwaukee Metropolitan Sewerage District Conveyance and Treatment System	2 students
11	Nov 5	Total Maximum Daily Load (TMDL) for Whiteoak Bayou in Harris County, Texas	2 students
12	Nov 12	Optimization for Urban Watershed Management: Stormwater Runoff and Nonpoint Pollution Control	2 students
13	Nov 19	Evolution of Agricultural Watersheds in a Systems Management Framework	2 students
	Nov 26	Thanksgiving Break – no class	
14	Dec 3	Developing a Regulation Policy for Lake Superior: Optimization and Trade-Off Analysis	2 students
15	Dec 10	Final Exam	

Instructor [Mark H. Houck](#)

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Office Hours Tuesday, 2:30 – 4:00 pm
Wednesday, 1:00 – 2:30 pm