

Syllabus for CEIE 340 - Water Resources Engineering Fall 2008

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Room 309, Science & Technology II Building

Office Hour: Wednesday, 10:00 AM – 12:00 Noon

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Lecture: Wednesday, 4:30 – 7:10 PM,
Bldg. Science and Technology II, Room 7

Labs: Wednesday, 1:45 – 4:15 PM, Bldg. ST1, Room 128
Wednesday, 7:20 – 10:00 PM, Innovation Hall, Room 336

Textbook: *Hydrologic Analysis and Design*
by Richard McCuen, 3rd edition, Prentice-Hall

- 1. Course Objective:** To introduce the science and practice of hydrology and water resources engineering--including the physical processes of the hydrologic cycle, statistical analysis as it relates to water resources, hydrologic analysis, and water resources engineering design.
- 2. Description:** Introduction to the principles and practice of water resources engineering. Analytic methods and computer models for the design and evaluation of water resource projects such as flood control and river basin development. Topics include: hydrology; governing principles, common models, and typical applications for water resource systems; and design of storm water management systems, and sanitary sewers. Laboratory and field work are required on selected topics.
- 3. Student Outcomes:** The student who successfully completes this course should be able to:
 - Describe the hydrologic cycle
 - Understand the difference between analysis and synthesis (design)
 - Apply probability and statistics within the fields of hydrology and water resources engineering
 - Characterize watersheds
 - Analyze historical precipitation records for use in water resources analysis and synthesis
 - Model basic groundwater hydrology
 - Estimate peak discharges in streams
 - Design water resources engineering projects including detention basins

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- Analyze hydrographs
 - Perform channel and reservoir routing
4. **Lab:** Labs are held weekly on Wednesdays. Lab assignments will be published on the course Blackboard site. Be sure to fully review the rules for conduct of the lab and preparation of lab reports.
5. **Lab Reports:** Lab Reports are typically due at the start of the following lab and are expected to be a reflection of your professional work. They must be written with complete sentences, proper paragraphing, correctly punctuated and spelled, and contain:
- Title page title, your name and date
 - Section 1 – Problem statement of the problem to be solved
 - Section 2 – Discussion approach used, assumptions, analysis, etc.
 - Section 3 – Conclusions a single paragraph that describes the results of the problem
 - Appendices data which supports your conclusions

Late submissions will be checked but will receive a grade of zero. A minimum of 50% loss of credit will result from sloppy or unclear submissions.

6. **Software:** Word processor, spreadsheet and specialized hydraulics software will be required for this class. Word processor and spreadsheet software is available in all university computer labs. Hydraulics analysis software is available in several forms:
- Word processor and spreadsheet software will be required in this class. They are available in all university labs.
 - The Hydrologic Engineering Center of the US Army Corps of Engineers produces a suite of free, full-version, commercial analysis and design software used in water resources engineering. Their products are downloadable from the web.

The listing of the HEC site and products does not imply any endorsement of the products by George Mason University.

7. **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 them to ensure that all of your submissions are well written. Good writing is expected and will be reflected in the grades.
8. **Honor Code:** The George Mason Honor Code is in effect for this course. Please consult the University catalog for a complete statement of the Honor Code and see your instructor if you need further clarification.
9. **Exams:** The midterm and final exams will be in-class, open-book exams. All work will be done by you individually. No joint work or assistance will be allowed. All questions are to be directed to the instructor. Details on the exams are

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provided in the schedule below.

10. Grades: The assignments for the semester will include a number of lab and homework assignments, plus midterm and final exams. The contribution of each of these toward a semester score is given here:

- Labs and Homework 50%
- Midterm 25% Wednesday, October 22, 4:30 - 6:15 pm
- Final 25% Wednesday, December 10, 4:30 - 7:15 pm

11. Class Schedule: This is a tentative schedule.

Class	Class Date	Topic	Lab	Lab Due	Text & Reference
1	Aug 27, 2007	Introduction to Hydrology and Water Resources Engineering			McCuen, Chap. 1
2	Sep 03, 2007	Statistics and Hydrology	A	Sep 10, 2007	McCuen, Chap. 2
3	Sep 10, 2007	Watersheds	B	Sep 17, 2007	McCuen, Chap. 3
4	Sep 17, 2007	Precipitation	C	Sep 24, 2007	McCuen, Chap. 4
5	Sep 24, 2007	Frequency Analysis	D	Oct 1, 2007	McCuen, Chap. 5
6	Oct 1, 2007	Groundwater Hydrology	F	Oct 8, 2007	McCuen, Chap. 6
7	Oct 8, 2007	Peak Discharge Analysis and Design	E	Oct 15, 2007	McCuen, Chap. 7
8	Oct 15, 2007	Hydrologic Design Methods	G	Oct 22, 2007	McCuen, Chap. 7 & 8
9	Oct 22, 2007	Midterm Exam	H	Oct 29, 2007	
10	Oct 29, 2007	Hydrologic Design Methods	I	Nov 05, 2007	McCuen, Chap. 8
11	Nov 05, 2007	Hydrograph Analysis and Synthesis	J	Nov 12, 2007	McCuen, Chap. 9
12	Nov 12, 2007	Channel Routing	K	Nov 19, 2007	McCuen, Chap. 10
13	Nov 19, 2007	Reservoir Routing	L	Dec 03, 2007	McCuen, Chap. 11
	Nov 26, 2007	Thanksgiving Break			
14	Dec 03, 2007	LID, Water Quality, Evaporation, Erosion	M	Dec 10, 2007	McCuen, Chap. 13-15
15	Dec 10, 2007	Final Exam			

12. Download Lecture Notes, Lab Assignments and Solutions from the Blackboard website (<http://courses.gmu.com>).