

SYLLABUS

University of Florida

Department of Civil and Coastal Engineering

Fall 2018

CWR 5125 (class number 12376, section 0917) Groundwater Flow I

1. Catalog Description: (3 credit hours) – Graduate-level introduction to groundwater hydraulics, including hydrologic cycle, Darcy's equation, Dupuit assumption, well hydraulics, regional flow, saltwater intrusion in coastal aquifers, fate and transport of contaminants, and contaminant transport equations.

2. Pre-requisites: CWR 3201 (Hydrodynamics) and CWR 4202 (Hydraulics), or consent of the instructor.

3. Course Objectives: Students will become familiar with the fundamentals of groundwater hydraulics as they apply to saturated porous media flow. Problem-solving ability will be developed by means of homework and take-home exams that emphasize the application of fundamental concepts to groundwater flow and transport problems.

4. Instructor: Dr. Louis H. Motz

a. Office location: 418 Black Hall

b. Telephone: 352-294-7817

c. email address: lmotz@ce.ufl.edu

d. Office hours: Monday, Wednesday, and Friday, 8th period (3:00 p.m. – 3:50 p.m.) or by appointment.

5. Meeting Times: 7th period (1:55 p.m. – 2:45 p.m.)

6. Class Schedule: Monday, Wednesday, and Friday

7. Meeting Location: Weil 238

8. Recommended Textbook: This textbook is *recommended*, but not *required*. Several of the homework assignments will be made from this book:

Schwartz, F.W., and Zhang, H., 2003, Fundamentals of Ground Water, John Wiley & Sons, New York, 583 pp.

9. Selected References: Selected parts of the following publications will be used as source material for some of the lectures:

Batu, V., 1998, Aquifer Hydraulics: A Comprehensive Guide to Hydrogeologic Data Analysis, Wiley, New York, 727 pp.

Batu, V., 2006, Applied Flow and Solute Transport Modeling in Aquifers: Fundamental Principles and Analytical and Numerical Methods, Taylor & Francis, 667 pp.

Bear, J., 1972, Dynamics of Fluids in Porous Media, Dover Publications, 784 pp.

Bear, J., 1979, Hydraulics of Groundwater, Dover Publications, 592 pp.

Butler, J.J., Jr., 1998, The Design, Performance, and Analysis of Slug Tests, Lewis Publishers, Boca Raton, Florida, 252 pp.

Charbeneau, R.J., 2010, Groundwater Hydraulics and Pollutant Transport, Waveland Press, 593 pp.

Delleur, J.W., Editor, 1999, The Handbook of Groundwater Engineering, CRC Press, Boca Raton, Florida.

Fernald, E.A., and Purdum, E.D., Editors, 1998, Water Resources Atlas of Florida, Institute of Science and Public Affairs, Florida State University, Tallahassee, 312 pp.

10. Course Outline:

Weeks	Topics	Assignment (Chapter)
1 - 2	Hydrologic Cycle, Impacts of Pumping, and Physical Properties	1, 2, and 3 (Schwartz and Zhang 2003)
3 - 5	Equations of Groundwater Flow and Aquifer Systems	3, 4, and 5 (Schwartz and Zhang 2003)
6 - 7	One-Dimensional Flow in Confined Aquifers	5 (Bear 1979)
8 - 10	Radial Flow and Well Hydraulics	9, 10, 12, and 13 (Schwartz and Zhang 2003)
11 - 12	One-Dimensional and Radial Flow in Phreatic Aquifers	8 and 11 (Schwartz and Zhang 2003), 4 (Bear 1979)
13 - 14	Saltwater-Freshwater Interface in Coastal Aquifers	9 (Bear 1979)

11. Course Materials:

Course material including lecture notes, homework assignments, and additional material will be provided on the UF e-Learning site <https://elearning.ufl.edu/>.

12. Attendance and Expectations: Classroom attendance and participation are expected. Homework assignments should be turned in on their due dates; the grade on a homework assignment turned in late will be deducted at a rate of 10 points per week.

13. Grading: Grading will be based on homework, a mid-term examination, and a final examination weighted as follows:

Homework	30 %
Mid-Term Exam	35
Final Exam	<u>35</u>
	100 %

14. Grading Scale:

Final Average	Course Grade
94-100	A
90-93	A-
87-89	B+
84-86	B
80-83	B-
77-79	C+
74-76	C
70-73	C-
67-69	D+
64-66	D
60-63	D-
< 60	E

Reminder: Graduate students need an overall GPA of 3.00 truncated and a 3.00 truncated GPA in their major (and in the minor, if a minor is declared) at graduation.

15. Honesty Policy: All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a UF student and to be honest in all work submitted and exams taken in this course and all others.

Note: Failure to comply with this commitment will result in disciplinary action compliant with the UF Student Honor Code Procedures.

See <http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>

16. Accommodation for Students with Disabilities: Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, www.dso.ufl.edu/drc/) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

17. UF Counseling Services: Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:

UF Counseling & Wellness Center, 3190 Radio Rd, 392-1575, psychological and psychiatric services.

Career Resource Center, Reitz Union, 392-1601, career and job search services.

18. Software Use: All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

19. Course Evaluation: Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.