

EVR 4211 Water Resources  
Department of Earth and Environment

Fall 2010

Location: OE 105  
Time: TR 11:00-12:15  
Instructor: Assefa M. Melesse, Office: ECS 339  
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Office Hours: TR: 1:00-3:00 PM

### Course Description

The course is designed to provide students with an insight of the different elements of water resources science. Students will familiarize themselves with hydrological cycle and factors involved in influencing the cycle, the physical and chemical properties of water and hydrological processes responsible for the distribution and movement of water. Solving hydrological problems, water quality and quantity estimation, management and planning of water resources and projects will be stressed. Students will gain an understanding of the environmental impacts of water, water resources, and changes in water supply and availability, and they will be introduced to current and emerging trends in water resource issues, development, and technology. Students will learn through lectures, guest lectures, home work, and lab analysis.

### Objectives

The course is designed to help students to

1. understand the water resources at local, national and global levels and the challenges ahead
2. acquaint themselves with the elements hydrological cycle and processes
3. solve hydrological problems involving water quantity and quality
4. understand natural and human-induced factors in altering the hydrological cycle and processes
5. apply knowledge gained in class to solving local water resources problems:  
Everglades hydrology and urban flooding

**TEXTS:** Ward and Trimble, Environmental Hydrology, 2<sup>nd</sup> Edition

### **REFERENCES:**

Davis and SJ Masten, Principles of Environmental Engineering and  
Science, ML, McGraw Hill, 2004  
Dingman, Physical Hydrology, 2<sup>nd</sup> edition  
Viessman, Intro. to Hydrology, 5<sup>th</sup> edition

Cech, Principles of Water Resources: History, Development,  
Management and Policy, 2<sup>nd</sup> edition  
Hornberger, Elements of Physical Hydrology

**Useful Links**

Glossary of Hydrological terms: [http://or.water.usgs.gov/projs\\_dir/willgw/glossary.html](http://or.water.usgs.gov/projs_dir/willgw/glossary.html)  
South Florida Water Management District: [www.sfwmd.gov](http://www.sfwmd.gov)  
Florida water (USGS): <http://fl.water.usgs.gov/>  
USGS Drinking Water programs: <http://water.usgs.gov/owq/dwi/index.html>  
Water Use: <http://water.usgs.gov/watuse/>  
USGS Groundwater Information: <http://water.usgs.gov/ogw/>  
USGS surface water Information <http://water.usgs.gov/osw/>  
Wetland Functions and Values: <http://www.epa.gov/watertrain/wetlands/index.htm>  
Rainfall atlas maps: [http://www.srh.noaa.gov/lub/wx/precip\\_freq/precip\\_index.htm](http://www.srh.noaa.gov/lub/wx/precip_freq/precip_index.htm)  
ET concepts: <http://www.fao.org/docrep/X0490E/X0490E00.htm>

**GRADING:**

EVR 4211	
Attendance	5%
Home works	35%
3 Exams	60%
Total	100

A	90-100
B+	88-89
B	80-87
C+	78-79
C	70-77
D+	68-69
D	55-67
F	<55

**Academic Misconduct**

Florida International University is a community dedicated to generating and imparting knowledge through excellent teaching and research, the rigorous and respectful exchange of ideas, and community service. All students should respect the right of others to have an equitable opportunity to learn and honestly demonstrate the quality of their learning. Therefore, all students are expected to adhere to a standard of academic conduct, which demonstrates respect for themselves, their fellow students, and the educational mission of the University. All students are deemed by the University to understand that if they are found responsible for academic misconduct, they will be subject to the Academic Misconduct procedures and sanctions, as outlined in the Student Handbook.

## COURSE OUTLINE

Lec	Date	Topic	Reading Assignment/ Home work
1	08/24	Course Overview Introduction, concepts in hydrology and properties of water	Davis (190-197)
2	08/26	Overview of hydrological cycles, physical processes and water budget	Ward (1-26) Davis (190-197)
3	08/31	Precipitation Measurement (Point and areal)	Ward (29-51)
4	09/02	Evaporation and Transpiration	Ward (83-117) <b>Home work 1</b>
5	09/07	<b>Exercise 1</b>	
6	09/09	Surface energy budget, soil water budget approach	Ward (83-117)
7	09/14	Infiltration & interception Storm runoff and stream flow analysis	Ward (55-80) <b>Homework 1 due</b>
8	09/16	Homework 1 solution	
9	09/21	<b>Exam 1 (Lecture 1-7)</b>	
10	09/23	Runoff computation	Ward (119-159)
11	09/28	Hydrograph analysis and base flow separation	Ward (119-159)
12	09/30	Wetland Definition, Functions of Wetlands	Ward (315-317)
13	10/05	Groundwater hydrology	Ward (321-337) Davis (208-217)
14	10/07	Aquifers, Hydrostatics, Darcy's law (diffusion), Permeability	Ward (321-337) Davis (208-217)
15	10/12	Hydrology of urban watersheds	Ward (339-372) <b>Homework 2</b>
16	10/14	Water use and sustainability	
17	10/19	<b>Exercise 2</b>	
18	10/21	<i>Invited talk on hydrology of South Florida</i>	Dr. Wossenu Abteu, SFWMD
19	10/26	Homework 2 solution	<b>Homework 2 due</b>
20	10/28	Drinking water quality and health	Davis (323-328)
21	11/02	<b>Exam 2 (Lecture 10-20)</b>	
22	11/04	Water Pollution and its Prevention Coastal and fresh water eutrophication Mechanism and environmental impact	Davis (265-280)

23	11/09	Point source pollution and non-point source pollution TMDL	Davis (271-280)
24	11/11	Water quality Management: BOD, COD	Davis (271-297)
25	11/16	Wastewater treatment	Davis (371-384)
26	11/18	<i>Guest lecture: GLOWS overview</i>	Dr. Elisabeth Anderson
27	11/23	Water Resources Video	
	11/25	Thanksgiving	
28	11/30	Study for the exam	
29	12/02	<b>Exam 3 (Lecture 22-27)</b>	