

EVR 5219 Water Resources Assessment
Department of Earth and Environment

Fall 2017

Room: Graham Center 285
Location: FIU MMC
Time: TR: 11:00AM-12:15PM
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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, and home work.

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

TEXT: Ward and Trimble, Environmental Hydrology, 2nd or 3rd Edition

ADDITIONAL REFERENCES:

Viessman, Intro. to Hydrology, 5th edition
Davis and SJ Masten, Principles of Environmental Engineering and Science, ML, McGraw Hill, 2004
Dingman, Physical Hydrology, 2nd edition
Cech, Principles of Water Resources: History, Development, Management and Policy, 2nd edition
Hornberger, Elements of Physical Hydrology

Useful Links

Glossary of Hydrological terms: http://or.water.usgs.gov/projs_dir/willgw/glossary.html

South Florida Water Management District: 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

ET concepts: <http://www.fao.org/docrep/X0490E/X0490E00.htm>

Lectures, exercises and other materials will be available at a dropbox link at [2017 Water Resources](#)

GRADING:

EVR 5219	
3 Exams	60%
4 Regular Quizzes	20%
Paper review and presentation	20%
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

You will be required to pick a topic in water resources and environment area and review peer-reviewed papers on the area of the topic selected. Prepare a 5-8 page review paper with 1.5 spaces 12 points font. You will have to do a PowerPoint presentation of your paper (15-20 min long)

Your paper will follow a standard scientific paper format with Abstract, Introduction (which includes statement of the problem, knowledge gap, other studies, and objectives or research questions), data and study area description, methods, results and discussion and conclusions. Also add appropriate references with a consistent formatting.

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/ EXERCISE
1	08/22	Course Overview Introduction, concepts in hydrology and properties of water	Davis (190-197)
2	08/24	Overview of hydrological cycles, physical processes and water budget	Ward (1-26) Davis (190-197)
3	08/29	Precipitation Measurement (Point and areal)	Ward (29-51) Exercise 1
4	08/31	Evaporation and Transpiration	Ward (83-117)
5	09/05	Surface energy budget, soil water budget approach Quiz 1 (Lec. 1-3)	Ward (83-117) Exercise 2
6	09/07	Exercise 1 solution	
7	09/12	Infiltration & interception Storm runoff and stream flow analysis	Ward (55-80)
8	09/14	Exercise 2 solution	
9	09/19	Runoff computation	Ward (119-159)
10	09/21	Hydrograph analysis and base flow separation	Ward (119-159)
11	09/26	Drinking water quality and health Quiz 2 (Lec. 4, 5, 7)	Davis (323-328)
12	09/28	Water Pollution and its Prevention Coastal and fresh water eutrophication Mechanism and environmental impact	Davis (265-280)
13	10/03	Exam 1 (Lectures 1-7)	
14	10/05	Point source pollution and non-point source pollution TMDL	Davis (271-280)
15	10/10	Wetland Definition, Functions of Wetlands	Ward (315-317)
16	10/12	Hydrology of tropical watersheds: Case of Mara River basin	
17	10/17	Groundwater hydrology	Exercise 3 Ward (321-337) Davis (208-217)
18	10/19	Aquifers, Hydrostatics, Darcy's law (diffusion), Permeability	Exercise 4 Ward (321-337) Davis (208-217)
19	10/24	Exercise 3 solution Quiz 3 (Lec. 12, 14, 15)	

20	10/26	Exercise 4 solution	
21	10/31	Hydrology of South Florida	
22	11/02	Exam 2 (Lectures 8-16)	
23	11/07	Water use and sustainability	
24	11/09	Hydrology of urban watersheds Land cover change and hydrological response: Modeling impacts Quiz 4 (Lec. 17, 18, 23)	Ward (339-372)
25	11/14	Climate change and water resources: GCMs and climate data downscaling, impact assessment	
26	11/16	Graduate students' presentation 1	
27	11/21	Guest Lecture	
	11/23	Thanksgiving: No class on Nov. 23 & 24	
28	11/28	Graduate students' presentation 2	
29	11/30	Exam 3 (Lectures 17-25)	
30	12/05	Final paper submission	Submit paper by Dec. 05, 2017