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  
Instructors: Assefa M. Melesse, Office: AHC 5-390  
Tel. (305) 348-6518  
E-mail: melessea@fiu.edu  

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  
- Dingman, Physical Hydrology, 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/
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

Lectures, exercises and other materials will be available at a dropbox link at 2017 Water Resources

GRADING:

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<tr>
<th>EVR 5219</th>
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<tbody>
<tr>
<td>3 Exams</td>
<td>60%</td>
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<tr>
<td>4 Regular Quizzes</td>
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<tr>
<td>Paper review and presentation</td>
<td>20%</td>
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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.
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<tr>
<th>LEC</th>
<th>DATE</th>
<th>TOPIC</th>
<th>READING ASSIGNMENT/ EXERCISE</th>
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| 1   | 08/22 | Course Overview  
Introduction, concepts in hydrology and properties of water | Ward (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)**                                              | Ward (323-328)              |
| 12  | 09/28 | Water Pollution and its Prevention  
Coastal and fresh water eutrophication  
Mechanism and environmental impact                                     | Ward (265-280)              |
| 13  | 10/03 | **Exam 1 (Lectures 1-7)**                                             |                               |
| 14  | 10/05 | Point source pollution and non-point source pollution  
TMDL                                                            | Ward (315-317)              |
| 15  | 10/10 | Wetland  
Definition, Functions of Wetlands                                 | Ward (271-280)              |
| 16  | 10/12 | Hydrology of tropical watersheds: Case of Mara River basin           | Ward (321-337)  
**Exercise 3**  
Davis (208-217) |
| 17  | 10/17 | Groundwater hydrology                                                 | **Exercise 4**  
Ward (321-337)  
Davis (208-217) |
| 18  | 10/19 | Aquifers, Hydrostatics, Darcy’s law (diffusion), Permeability         |                               |
| 19  | 10/24 | **Exercise 3 solution**  
**Quiz 3 (Lec. 12, 14, 15)**                                         |                               |
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<td>10/26</td>
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<td>10/31</td>
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<td>11/02</td>
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<td>Land cover change and hydrological response:</td>
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<td>Modeling impacts <strong>Quiz 4 (Lec. 17, 18, 23)</strong></td>
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<td>11/14</td>
<td>Climate change and water resources: GCMs and</td>
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<td>11/21</td>
<td><strong>Guest Lecture</strong></td>
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<td>11/23</td>
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