Instructor Information:
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Graduate Teaching Assistants:
Software instruction and grading: Dr. Redi Sileshi (rksileshi@crimson.ua.edu)  
Project evaluation: Leila Talebi, Ph.D. student (leyla.talebi@gmail.com)


Course Description:
Sustainable Urban Water Systems is the integration of water delivery, wastewater collection, drainage systems, and associated treatment components in urbanizing areas, done in a manner that utilizes the resources to their best advantage, with minimal waste and energy use. Traditionally, these topics are mostly examined in isolation. However, the growing field of Urban Water Systems recognizes and studies the obvious connections between these areas as an integral science. In addition, it is difficult to separate surface and groundwater elements of water sources and disposal, although most academic approaches examine these in isolation. Obviously, this course cannot cover all these topics in detail, but will attempt to examine the relationships between them, and areas that have not received adequate attention in prior classes.

We will review and use three modern design models during this class:
- WinSLAMM will be used to investigate stormwater sources, beneficial uses, and control options,
- EPANET will be used to investigate domestic water supply system designs affected by water conservation options, including wastewater reuse and stormwater beneficial uses, and
- SWMM5 will be used to investigate drainage systems for both stormwater and sanitary wastewater, especially considering the effects of reduced flows due to beneficial uses, reuse and water conservation in the service areas.

The use of these models will enable us to quantify the benefits of non-traditional options (such as wastewater reuse, de-centralized treatment, water conservation, etc.) on urban water infrastructure. These models are possibly the most popular models currently being used for the design of water supply systems, stormwater collection systems, and for sanitary wastewater collection systems. These models have also been used for many years (and had previous DOS versions) and employers are very interested in applicants having some exposure and experience with these models. The EPA models are also all open-coded and in the public domain, plus have excellent technical support. The EPA models and documentation are freely downloadable, and Internet user groups exist for the models that offer great assistance. All of the models are new versions, enabling rapid access to basic and advanced model features.
## Class Topics, Reading, and Approximate Schedule

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<td>3. Water use</td>
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<td>6. Wastewater collection system design with SWMM5</td>
<td>M6c SWMM5 class guide</td>
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<td>8. Stormwater green infrastructure modeling with WinSLAMM</td>
<td>WinSLAMM installation and M8e, M8f, M8g, M8h</td>
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<td>9. Stormwater collection system design</td>
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<td>10. Integrated urban water system designs</td>
<td>Ch. 4, M10a, M10b Cost report and spreadsheet, <em>Designs for the Future</em></td>
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*Designs for the Future* is posted on the class web site and was an early EPA report I prepared that was integrated into several other EPA publications. That report should also be read during the course as it pertains to many of the class modules, especially on how the urban water system designs are integrated.

### Course/Student Objectives:

Students completing this class will be able to effectively use three complementary urban water models, and to understand local water resources problems. Specifically, they will be able to examine the interactions between water supply and drainage systems; between surface and groundwaters; and to understand beneficial uses of wastewaters.

### Major Assignments:

There will be three modeling project assignments along with a final integrated project what will be prepared during the term. Each class will be divided into small teams that will examine a case study on their campus (for UA). For UAB and UAH students, with a campus location, or other area in the community, can be examined for the projects.

The final project will be an integrated urban water system design prepared by a small class team using actual or assumed information for an area. The teams will prepare a brief description of the site, and a workplan for the elements to be considered. This description and workplan will be due by Spring Break. Short presentations will also be made describing the proposed design projects. The final design will be presented in a short design report and will be presented on the night of the final exam. Additional assignment information will be forthcoming.

### Prerequisites:

Basic water resources/hydrology/hydraulics, such as presented in CEE 378, Water Resources Engineering, is the preferred minimal prerequisite. Students having Stormwater Management, Hydrology, Groundwater, and Hydraulics classes will be able to examine the topics and projects in more detail. Environmental Health topics, including Risk
Assessment will only be briefly presented, and students with backgrounds in these areas will also be able to provide more depth in these areas in their projects.

**First Day of Class**: January 8, 2014  
**MLK Holiday (no classes)**: January 20, 2014  
**Spring break (no classes)**: March 21 to 28, 2014  
**Last Day of Class**: April 23, 2014  
**Final Exam**: Friday, April 28, 2014, 3:30 to 6:00 pm (we will have UAB final presentations on April 23, 2014 due to different schedules)

**Grading and attendance:**  
Assignments for this class will consist of 3 preliminary modeling reports and presentations (60%), plus the final project and presentation (40%). If you complete an assignment as given, and it is correct and presented in a professional manner, you will have done what is expected and will receive an above average (B) grade. You will receive an “excellent” (A) grade only for work of an outstanding caliber. Late submittals, if accepted at all, will receive lowered grades. If you are not able to submit an assignment on time, prior notification and arrangements are required. Attendance to all class sessions, and participation in discussions, is required. Repeated unexcused absences will result in lowered class grades. No cell phones or other communication devices are to be used in class, except in an emergency. Laptops can be used to take notes or to follow the presentations. All assignments will be submitted to Dr. Sileshi using a Dropbox account (graded assignments will also be returned by the Dropboxes). He will provide information on how to set up these free accounts.

**Disabled Student Policy:**  
Reasonable accommodations for disabled students are made on an individualized basis. However, it is the responsibility of persons with disabilities to seek available assistance and make their needs known. The University has designated the Office of Disability Services (348-4285) as the campus coordinating office for the provision and delivery of services and reasonable accommodations that ensure the University's programs, services, and activities are accessible to students with disabilities. The Office of Disability Services is available to assist any student who has a qualified and documented disability.