CE 427/527 STORMWATER MANAGEMENT
5:00 to 6:30 PM Tu and Th
Fall 2009 room 215 AIME

Instructor: Robert Pitt, P.E., Ph.D., DEE, Cudworth Professor of Urban Water Systems
Office: Bevill (move sometime during term, otherwise in 347B HM Comer)
Office Hours: Tu and Th after class (or most any time when I am in the office, except right before class), by appointment, or email anytime and I will get back to you as soon as possible (depending on access to email!)
Phone: 348-2684
e-mail: rpitt@eng.ua.edu (home email: rpittal@charter.net)

Catalog Data: Quality and quantity of urban stormwater. Receiving water problems and sources of pollutants. Runoff quality and quantity characteristics. Selection and design of controls; regulations.

Prerequisites: Water Resources Engineering (CE 378) and Hydrology (CE 475), or permission of instructor


Course Objectives: At the successful completion of this course, the student will understand new regulations pertaining to stormwater and review receiving water impacts due to stormwater discharges, sources of pollutants, and how this information will enable effective control options to be identified, integrate drainage design for both quality and quantity issues for a wide range of storm conditions, costs of stormwater controls, and apply decision analyses to select the most efficient stormwater management solutions.

Course Topics
1. Stormwater regulations and TMDL requirements
2. Stormwater problems and receiving water beneficial use impairments
3. Stormwater characteristics and pollutant sources
4. Stormwater controls
5. Use of stormwater models to evaluate local problems and to develop cost-effective solutions
Course Website  
http://unix.eng.ua.edu/~rpitt/ then select “classes and workshops” and stormwater management which will bring you to:  
http://unix.eng.ua.edu/~rpitt/Class/StormWaterManagement/MainSWM.html  
It is expected that most of these presentations will be updated throughout the term.

Additional Texts and References  
Assorted readings; course material available from the Internet. Stormwater Effects Handbook for some readings at:  

Suggested Texts and References  
Will be listed during course. Many are located at:  
http://unix.eng.ua.edu/~rpitt/Publications/Publications.shtml

Grading  
**Major Course Assignments:** The class assignments will consist of four components:  
1) About 10% of course grade: Select and review a local TMDL report addressing urban stormwater components. Prepare a summary of the problems identified, the methods used to predict the sources of the problem pollutants, and the control strategy needed to meet the receiving water objectives. This will be due on September 8, 2009.

2) About 35% of course grade. Leading up to your final design project, select an existing developed single land use area near where you live, such as a housing development, commercial shopping center, or industrial park. It should be between 10 and 100 acres in size. Make sure you have good aerial photo coverage. As an example, Google map has excellent aerials on the eastern part of Tuscaloosa (generally east of 359/69, including all of the downtown area and campus), but is degraded to the west, while all of the Birmingham area has excellent coverage. However, it is all several years old. Measure the source areas, using the aerial photograph and conduct a ground survey. Determine the flow and major pollutant sources for each of the source areas for a range of rains. This will be due on October 8, 2009.

3) About 35% of course grade. Select and make preliminary designs for stormwater controls for your area, including source controls and outfalls, as appropriate. Stress conservation design, but also consider needed treatment before discharge to ground and surface waters. Present two final scenarios, one for retrofitting or redevelopment of the site, and another that is most suitable for new development. This will be due on November 17, 2009.

4) About 20% of course grade. Prepare a comprehensive stormwater management plan for your site, incorporating the above information and analyses, along with additional needed and relevant information, such as costs. A final PowerPoint presentation will also be made during the scheduled final period. The final is scheduled on December 9, 2009.

The due dates shown above allow students sufficient time to complete the needed work. Late submissions will hinder the future assignments, and will be strongly discouraged. Students taking the class at the graduate student level will be expected to prepare more comprehensive and detailed plans for their project.
| **Attendance Policy** | Students are expected to attend all lectures. In an absence is unavoidable, the student should contact the instructor before the class meets. Excessive unexcused absences may result in grade reductions. |
| **Homework Policy** | All homework (projects) will be submitted when due. |
| **Exam/Quiz Policy** | There will be no in-class exams or quizzes. The course grade will be comprised of project submittals. |
| **Policy on Missed or Late Coursework** | Late submittals of assigned material will be subject to a reduction in grade. An incomplete will be given if any of the 4 major assignments is not submitted. |
| **Other Course Policies** | All electronic devices will be turned off while in class. No checking with emails or texting will be allowed while in class. Work or personal emergencies exempted. Laptop computers allowed, but only in support of class activities. Sidebar discussions and other distracting activities are strictly prohibited. This is especially relevant with ITS classes where the receiving class students may have a harder time following the presentations. |
| **Course Portfolio Material** | The Department requires every undergraduate student in every class to develop a course outcome portfolio. Through the course portfolio, each student is to demonstrate their achievement of the specific program outcomes addressed in each course (see the “Contribution to Program Student Outcomes” section of this syllabus). Graded work from the course may be used to illustrate achievement of the outcomes. Several assignments, projects, and/or quiz/exam questions in each course will address specific outcomes. If a student does well in these assignments, they would be suitable examples for inclusion in the degree portfolio. The portfolios will be collected prior to or during the final exam. The intent of this requirement is to assist students with the development of a well-organized program outcome achievement portfolio required for graduation. The portfolio must be organized with tabs indicating each outcome separately (e.g., T3, T5, T6, and P2). Behind each tab, student work demonstrating command of the respective outcome should be neatly presented. All materials must be three-hole punched, but do not use a three-ring binder. Rather, the portfolio materials must be secured with appropriately sized binder clips. A cover page is required and must include the student’s name, the course number and title, and the term the course was taken. |
| **Academic Misconduct** | Any act of dishonesty in any work constitutes academic misconduct. The Academic Misconduct Disciplinary Policy will be followed in the event of academic misconduct and will be handled by the Dean’s office. |
Accommodations

Reasonable accommodations are made on an individualized basis. It is the responsibility of persons with disabilities, however, to seek available assistance and make their needs known. The University has designated the Office of Disability Services 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. Please contact the Office of Disability Services at 348-4285 for additional information.

Schedule/Topic Outline

Main Class Topics:
1. Stormwater regulations
2. Stormwater problems and receiving water beneficial use impairments
3. Stormwater characteristics and pollutant sources
4. Stormwater controls
5. Use of stormwater models to evaluate local problems and to develop cost-effective solutions

Midterm Exam Date(s)

There is no scheduled midterm for this class.

Final Exam Date:
Final: Wednesday, December 9, 2009, 7 to 9:30 PM (Power Point presentation and final report due)

Other Important Dates:
First day of class: August 20, 2009
Last class period: December 3, 2009
Thanksgiving holiday (no class): November 26, 2009

Travel Dates:
We will not have scheduled class lectures on the following nights, but it is expected that students will continue to work on their assignments and readings:
Sept 10, 15, and 17; OK field activities
Oct 13 and 15; WEFTEC conf, Orlando
Oct 22, 27, and 29; Shanghai CSO conference and meetings
Nov 10 and 12; AWRA conf, Seattle
# Outcomes and Course Assignments: CEE 427 Stormwater Management

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Description</th>
<th>Assign. 1 TMDL reviews</th>
<th>Assign. 2 Source contributions and hydrology</th>
<th>Assign. 3 Applications of stormwater controls</th>
<th>Final Project Designs</th>
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<tbody>
<tr>
<td>Outcome F1: (Level 3)</td>
<td><strong>Solve</strong> problems in mathematics through differential equations, probability and statistics, calculus-based physics, general chemistry, and one additional area of science. (level 3)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td>Outcome T3: (Level 3)</td>
<td><strong>Apply</strong> relevant knowledge, techniques, skill, and modern engineering tools in the area of environmental and water resources engineering. (level 3)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td>Outcome T4: (Level 3)</td>
<td><strong>Use</strong> basic elements of stormwater management that is a multidisciplinary field and considers many aspects of society’s needs, along with technical conflicts. The design of stormwater management systems during this class illustrates these attributes. (level 5)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td>Outcome T7: (Level 2)</td>
<td><strong>Define</strong> the emerging field of stormwater management that has many key elements. (level 5)</td>
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<td>Outcome P1: (Level 4)</td>
<td><strong>Discuss</strong> and use in assignments conflicting professional and ethical issues that need to be addressed in stormwater evaluations. (level 4)</td>
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<td>Outcome P2: (Level 4)</td>
<td><strong>Written</strong> assignments are a basic part of this course. The final student project design is submitted as a written report, along with a PowerPoint presentation. (level 4)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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