1. **Department, number, and title of course**

   Department of Civil Engineering, CENG 5342, Analysis of Urban Water Systems

2. **Graduate Course**

3. **Course (catalog) description**

   The course examines the behavior and interaction between all phases of urban water management: water supply, stormwater management, water distribution, and wastewater collection. Students learn how conservation practices and water sensitive urban design can reduce the amount of water required by an urban area.

4. **Prerequisite(s)**

   MENG 3310, Fluid Mechanics, or Equivalent course in Open Channel Flow

5. **Textbook(s) and/or other required material**


6. **Course Objectives**

   - Analyze and design water distribution system using current analysis programs.
   - Perform water demand forecasts using a multivariable approach.
   - Run a stormwater management model on an urban watershed and stormwater sewer system.
   - Apply water balance models in various water resource applications.
   - Introduce students to water quality modeling and standards.

7. **Topics Covered**

   - Urban Water System Operation
   - Water Distribution System Analysis and Design
   - Fire Flow Analysis in Water Distribution Systems
   - Water Demand Forecasting Technologies and Approaches
   - Sanitary and Storm Sewer Design
   - Stormwater Infiltration and Runoff
   - Water Quality Modeling
   - Water Balance Modeling

8. **Class/laboratory schedule, i.e., number of sessions each week and duration of each session**

   LESSONS: 30 @ 50 min (2 att/wk)  
   LABS: 3 hrs/wk.
9. **Contribution of course to meeting the professional component**

3.0 Credit Hours (ES=2.0, ED=1.0)

This course provides students the opportunity to learn about the complex and interconnected nature of stormwater, wastewater, and drinking water systems. Through design-oriented projects, students not only learn about each sector’s unique design requirements, but also gain valuable insight into the varying user objectives and system performance limitations. This course encourages students to develop solutions that improve water use efficiency.

10. **Relationship of course to program outcomes**

The course director’s assessment of how this course contributes to the civil engineering program outcomes is listed below. The following scale is used:

1=No Contribution; 2=Small Contribution; 3=Average Contribution; 4=Large Contribution; 5=Very Large Contribution

<table>
<thead>
<tr>
<th>CIVIL ENGINEERING PROGRAM OUTCOMES</th>
<th>Course Director Assessment</th>
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<tbody>
<tr>
<td>Program Outcomes</td>
<td></td>
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<tr>
<td>Students who qualify for graduation with a civil engineering masters will demonstrate:</td>
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<tr>
<td>Have developed specialized knowledge in civil engineering beyond that normally expected of undergraduates preparing them for advanced professional practice.</td>
<td>4</td>
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<tr>
<td>When conducting graduate research, have generated new knowledge and engineering methods to serve the State, the Nation, and the global community.</td>
<td>2</td>
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11. **Person(s) who prepared this description and date of preparation**

Dr. Peter D. Rogers, PE, Assistant Professor, 25 October 2007.