ENVE 417  HYDRAULIC DESIGN  TOPIC SYLLABUS

Current Catalog Data:
Design of water and waste water conveyance systems and storage facilities. Design of Storm
Sewers, Inlets, Detention Basins, Culverts, Sanitary Sewers, and Water Distribution Systems.

Required Textbook:

Supplemental Textbooks:
383-2125-108, *Department of Environmental Protection - Bureau of Water Supply Management,
Commonwealth of Pennsylvania, Harrisburg, PA, September 1, 1997*
Michael E. Meadows and Thomas Walski (Haestad Methods Engineering Staff). *Computer
George Tchobanoglous (Metcalf & Eddy, Inc.). *Wastewater Engineering: Collection and
1988*
*Water Distribution Modeling*, Thomas M. Walski, Donald V. Chase, and Dragan A. Savic,
*Haestad Methods, Inc., 2001*
Publications, Inc., 2001*
77), *ASCE Press, Reston, VA, 1993*

Course Goals:
Learn fundamentals of water supply, sanitary wastewater and stormwater drainage. Integrate
designs for assigned local design area. Apply decision analyses to select most efficient solution.
Present design solutions and literature research in a professional manner.

Course Objectives:
1. Use the locally available libraries to locate information regarding locally relevant issues of water
supply and drainage.
2. Appropriately apply design equations (Manning’s, Darcy-Weisbach, and Hazen-Williams) to water
supply and storm drainage problems.
3. Estimate water supply, wastewater and stormwater flow rates for a given area.
4. Use EPANET software (or WATERCAD) to evaluate your water supply design for an assigned
neighborhood. Use the software to modify the design as needed. (EPANET available at
http://www.epa.gov/)
5. Design both a wastewater and a separate stormwater design for your assigned neighborhood.
6. Present the results of your research on an assigned, locally relevant issue to the rest of the class in
accordance with the given guidelines.
**Prerequisite by Topic:**
- Basic algebra and basic fluid mechanics.

**Class Topics**

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<th>Class Topics</th>
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<tr>
<td>Introduction (history of water supply and drainage) and Review of</td>
<td>Applied Hydraulics (properties of fluids and energy equation</td>
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<td>Review of Applied Hydraulics (pipe, open channel and pump flow)</td>
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<td>Population Estimation and Water Forecasting</td>
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<td>Storage Tanks, Pumps and Pumping Systems</td>
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<td>Water Supply Design (including Hardy Cross)</td>
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<td>Water Supply Design (including EPANET and WATERCAD)</td>
<td>(In-Class Computer Model Training)</td>
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<tr>
<td>Wastewater Flows and Measurements and Inflow/Infiltration</td>
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<td>CSOs, SSOs and Biological Transformation in Sewers</td>
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<td>Sewer Appurtenances, Sanitary Sewer Design</td>
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<td>Sanitary Sewer Design (including SWMM 5 and SEWERCAD)</td>
<td>(In-Class Computer Model Training)</td>
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<td>Review of Hydrology (Watershed Delineation, Soils Maps)</td>
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<td>Rainfall and Runoff Estimation Methods</td>
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<tr>
<td>Inlet Design and Stormwater Drainage System Design (including SWMM 5 and</td>
<td>STORMCAD)</td>
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<td>(In-Class Computer Model Training)</td>
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<td>Culvert and Detention Basin Design</td>
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<td>Finish presentations and FINAL EXAM DUE</td>
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