


College of Engineering			
Department of Civil Engineering			
<b>CE 447 Water Supply and Drainage Systems</b>			
<b>Credit and Contact hours</b>	2 / 2 (Lectures), 1 (Tutorials), 0 (Laboratory)		
<b>Required, or Elective</b>	Required for a BSCE degree		
<b>Course Description</b>	Quantity of water, wastewater, and storm water. Design of water supply system, including pumping stations and storage capacity. Design of sanitary and storm sewer systems. Appurtenances of water, sanitary, and storm networks. Application of computer programs for design of water and sewer networks. Sewers construction and maintenance.		
<b>Prerequisites or Co-requisites</b>	<b>Pre-requisites:</b> Hydraulics (CE 324) <b>Co-requisites:</b> Hydrology (CE422)		
<b>Course Learning Outcomes</b>	Students completing this course successfully will be able to		
	<b>Course Learning Outcomes</b>		<b>Related Student Outcomes (SO)</b>
	CLO1. Review engineering requirements of different water supply and drainage systems		<b>SO7</b>
	CLO2. Analyse basic water supply and drainage systems using modern engineering tools .		<b>SO1</b>
	CLO3. Design water, sanitary, and storm systems taking into account the requirements of public health, safety and welfare of the community, in addition to environmental and economic factors		<b>SO2</b>
CLO4. Evaluate existing water, sanitary and storm systems considering global, economic, environmental and societal factors.		<b>SO4</b>	
<b>Student Outcomes related to this Course</b>	<b>SO1.</b> an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics [ABET 1], and using modern engineering tools <b>SO2.</b> an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors. [ ABET 2] <b>SO4.</b> an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must		

	<p>consider the impact of engineering solutions in global, economic, environmental, and societal contexts. [ABET 4]</p> <p><b>SO7.</b> an ability to acquire and apply new knowledge as needed, using appropriate learning strategies. [ABET 7]</p>																						
<b>Topics Covered</b>	<table border="1"> <thead> <tr> <th><b>List of Topics</b></th> <th><b>Related CLOs</b></th> </tr> </thead> <tbody> <tr> <td>1. Quantity of water and wastewater.</td> <td>CLO1</td> </tr> <tr> <td>2. Water supply system, including storage and appurtenances.</td> <td>CLO1</td> </tr> <tr> <td>3. Closed conduits hydraulics (review)</td> <td>CLO1</td> </tr> <tr> <td>4. Analysis and design of water networks.</td> <td>CLO2</td> </tr> <tr> <td>5. Pumping stations and pumps selection</td> <td>CLO1</td> </tr> <tr> <td>6. Quantity of storm water.</td> <td>CLO1</td> </tr> <tr> <td>7. Sewerage systems and appurtenances</td> <td>CLO1</td> </tr> <tr> <td>8. Hydraulics of sewers.</td> <td>CLO3</td> </tr> <tr> <td>9. Design of sanitary and storm sewers.</td> <td>CLO3</td> </tr> <tr> <td>10. Evaluation of existing water, sanitary and storm systems considering global, economic, environmental and societal factors (through a project )</td> <td>CLO4</td> </tr> </tbody> </table>	<b>List of Topics</b>	<b>Related CLOs</b>	1. Quantity of water and wastewater.	CLO1	2. Water supply system, including storage and appurtenances.	CLO1	3. Closed conduits hydraulics (review)	CLO1	4. Analysis and design of water networks.	CLO2	5. Pumping stations and pumps selection	CLO1	6. Quantity of storm water.	CLO1	7. Sewerage systems and appurtenances	CLO1	8. Hydraulics of sewers.	CLO3	9. Design of sanitary and storm sewers.	CLO3	10. Evaluation of existing water, sanitary and storm systems considering global, economic, environmental and societal factors (through a project )	CLO4
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<b>Textbook(s) and Other Required Material</b>	<ol style="list-style-type: none"> <li>1. T. J. McGhee, "Water Supply and Sewerage", by McGraw- Hill, 6th Ed, (1991).</li> <li>2. Hammer, M. J. and Hammer, M. J. Jr. "Water and Wastewater Technology" 6th edition, Prentice-Hall, Inc., Englewood Cliffs, New Jersey (2007).</li> <li>3. Viessman, Jr. W; Hammer M. J.; Perez E. M.; and Chalik, P. A. "Water Supply &amp; Pollution Control", 8th ed. (International Ed.), Pearson Higher Education (2009).</li> </ol>																						
<b>Grading System</b>	<table> <tr> <td>Two Mid-term exams</td> <td>40 %</td> </tr> <tr> <td>Quizzes</td> <td>10%</td> </tr> <tr> <td>Project</td> <td>10%</td> </tr> <tr> <td>Final Exam:</td> <td>40%</td> </tr> </table>	Two Mid-term exams	40 %	Quizzes	10%	Project	10%	Final Exam:	40%														
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<b>Instructors</b>	Dr. Mohab Amin (2A60), email; <a href="mailto:maamin@ksu.edu.sa">maamin@ksu.edu.sa</a>																						
<b>Date of Review</b>	November, 2020																						