College of Engineering

Department of Civil Engineering

CE 543 Planning and Design of Water and Wastewater Networks

Credit and Contact hours	3/ 3 (Lectures), 0 (Tutorials), 0 (Laboratory)
Required, or Elective	Required for a MSCE degree
Course Description	Development of design skills in water distribution and wastewater collection networks: Estimation of flows; systems layout and planning; selection and setting of design criteria; computer network analysis and design. Preparation of design reports for selected local projects.
Prerequisites or Co-requisites	None
Course Learning Outcomes	Students completing this course successfully will be able to

Course Learning Outcomes	***Related Program Outcomes***
CLO1: Recognize and identify the most critical issues and challenges in planning, designing, and operating water distribution and wastewater collection systems.	**K1**
CLO2: Develop design criteria (e.g., mass and flow inputs; performance requirements; general bulk/aggregate parameters) necessary for the preparation of designs for water and wastewater systems.	**S1**
CLO3: Analyze sanitary sewer collection systems and water distribution systems using computer programs (e.g., Watercad®, EPANET, Sewercad)	**S1**
CLO4: Design and evaluate water distribution systems using computer programs (e.g., Watercad®, EPANET) on selected real-life projects.	**C2**
CLO5: Design and evaluate wastewater collection systems using computer programs (e.g., Sewercad) on selected real-life projects.	**C2**

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<tr><td>Student Outcomes related to this Course</td><td>K1. Recognize advanced engineering knowledge, concepts and techniques to identify, interpret and analyze complex and real-life engineering problems.

S1. Provide solution for complex and real-life engineering problems through critical thinking and using modern engineering tools and identify its impact on social and ethical issues.

C2. Design novel advanced Civil Engineering systems and evaluate its performance and effectiveness for engineering practice and its impact on society.</td></tr>
<tr><td>Topics Covered</td><td>
<table>
<tr><th>List of Topics</th><th>Related CLOs</th></tr>
<tr><td>1. Water demands and types of water consumptions and water and wastewater network components</td><td>CLO2</td></tr>
<tr><td>2. Issues and challenges in planning, designing, and operating water distribution and wastewater collection systems</td><td>CLO1</td></tr>
<tr><td>3. Design criteria necessary for the preparation of designs for water and wastewater systems.</td><td>CLO2</td></tr>
<tr><td>4. Methods of water and wastewater networks analyses</td><td>CLO3</td></tr>
<tr><td>5. Use of computer programs to analyze and design water networks</td><td>CLO4</td></tr>
<tr><td>6. Use of computer programs to analyze and design wastewater networks</td><td>CLO5</td></tr>
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<tr><td>Textbook(s) and Other Required Material</td><td>1. Water and Wastewater Systems Analysis, Volume 34, 1st Edition.</td></tr>
<tr><td>Grading System</td><td>Assignments 20%
Project Work 20%
Midterm Exam 20%
Final Exam 40%</td></tr>
<tr><td>Instructors</td><td>Prof. Anwar Khursheed Ahmad
Office No:2 A 22/3
aahmad4@ksu.edu.sa</td></tr>
<tr><td>Date of Review</td><td>February, 2021</td></tr>
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