

College of Engineering

Department of Civil Engineering



CE 425 Surface and Groundwater Hydrology

Credit and Contact hours	3 / 3 (Lectures), 1 (Tutorials), 0 (Laboratory)	
Required, or Elective	Elective for a BSCE degree	
Course Description	Review of hydrologic cycle elements, computation of average precipitation, stream flow and stage relationship, hydrograph analysis, infiltration indices, hydrograph of basin outflow, storage routing for natural channels and reservoirs, probability concepts in design recurrence intervals, flood frequency analysis and flow direction curves, hydraulics of wells, boundary effects, wells construction and maintenance.	
Prerequisites or Co-requisites	CE 424 (Hydrology), Basic hydrology understanding	
Course Learning Outcomes	Students completing this course successfully will be able to	
	Course Learning Outcomes	<i>Related Student Outcomes (SO)</i>
	CLO1: Apply routing methods to calculate a surface runoff hydrograph from rainfall	SO1
	CLO2: Conduct frequency analysis to develop IDF curves	SO6
	CLO3. Identify of principles of Groundwater	SO1
	CLO4. Calculate Groundwater movement	SO1
CLO5. Calculate well hydraulics.	SO1	
Student Outcomes related to this Course	<p>SO 1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics, and using modern engineering tools. [ABET 1]</p> <p>SO 6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions. [ABET 6]</p>	
Topics Covered	List of Topics	Related CLOs
	1. Analysis of rainfall-runoff hydrographs .	CLO1
	2. Reservoir and channel flood routing	CLO2

	3. Frequency analysis and design for hydrological forecasting	CLO2						
	4. Introduction to groundwater and well hydraulics	CLO3						
	5. Methods of groundwater movement	CLO4						
	6. Well hydraulics and pumping operations	CLO5						
	7. Analysis of rainfall-runoff hydrographs .	CLO1						
Textbook(s) and Other Required Material	<ol style="list-style-type: none"> 1. Todd, D. K., and Mays, L. W. (2004). Groundwater hydrology. John Wiley & Sons. 2. Wilson, E. M. (1990). Engineering hydrology. In Engineering Hydrology (pp. 1-49). Palgrave, London. 3. Mays, L. W. (2012). Ground and surface water hydrology. Wiley. 							
Grading System	<table> <tr> <td>Quizzes and Home Works</td> <td>20%</td> </tr> <tr> <td>Two Midterm Exams</td> <td>40%</td> </tr> <tr> <td>Final Examination</td> <td>40%</td> </tr> </table>		Quizzes and Home Works	20%	Two Midterm Exams	40%	Final Examination	40%
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Instructors	Prof. Abdulaziz S. Al Turbak (2A24), email; Turbak@ksu.edu.sa							
Date of Review	September 2020							