College of Engineering Department of Civil Engineering



	CE 525 Surface Water Hydrology			
Credit and Contact hours	3 / 3 (Lectures), 0 (Tutorials), 0 (Laboratory)			
Required, or Elective	Required			
Course Description	Introduction to surface water hydrology, hydrologic cycle. Hydrologic Principles. Precipitation Frequency Analysis, Evaporation, and Infiltration. Unit hydrograph, Flood hydrograph computation and flood routing. Peak flow estimates using different methodologies. Hydrologic simulation using WMS and HEC-HMS.			
Prerequisites or Co- requisites	None			
Course Learning Outcomes	Students completing this course successfully will be able to:			
	Course Learning Outcomes (CLOs)	Related Student Outcomes (SO)		
	CLO1. Recognize the main processes and the theoretical basis involved in surface water flow. K1	SO1		
	CLO2. Develop rainfall Intensity, Duration and Frequency relationship. S1	SO2		
	CLO3. Estimate flow, flood hydrograph, storage and flood routing. S1	SO2		
	CLO4. Apply hydrological principles and models to real-world problems manually and using computer programs (e.g. HEC-HMS, HEC-RAS, and Arc-GIS). S1	SO2		
	CLO5. Effectively manage work plans and assigned tasks in individual coursework, assignments, and research project for presenting the results with scientific integrity and ethical responsibilities. V2	SO7		
	SO 1 Recognize advanced engineering knowledge, concepts, and techniques to identify,			
Student	interpret, and analyze complex and real-life engineering problems.			
Outcomes	and the use of modern engineering tools, and identify their impact on social, global,			
related to this	cultural, environmental, safety, and economic factors.			
Course	SO 7 Effectively manage, individually or in groups, specialized tasks and activities in coursework, projects, assignments, and research work with a high level of autonomy and responsibility.			

	List of Topics		Related CLOs
Topics Covered	1. The hydrologic cycle, runoff mechanisms and water balances		CLO 1,3,4
	2. Rainfall data and losses (interception, evaporation, storage, and infiltration)		CLO 1
	3. Rainfall Frequency Analysis and IDF Curves		CLO 2,4
	4. Application of Unit Hydrograph and synthetic UH		CLO 3,4
	5. Runoff Hydrograph and Flow Routing		CLO 3
	6. The overview of the different modelling techniques used in hydrology		CLO 4,5
	7.		CLO #
	8. Determination of Peak Discharge using Rational Method		CLO 3
	9. Curve Number method and its application		CLO 3,4
	10. Discussion on application WMS and HEC-HMS to solve a problem of flash flood event		CLO 4,5
Textbook(s)			
and Other	• Dependent		
Required	• Students		
Material			
Grading System	Assignments and Quizzes	15%	
	Lecture attendance		
	Seminar presentation	5%	
	Overview (literature review) paper	5%	
	Project - report and oral presentation	10%	
	Mid-term exam	25%	
	Final Exam	40%	
Instructors	Dr. Ibrahim Elsebaie/Dr. Mohamed Elmohawis		
Date of Review	March, 2025		