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 for a MSCE degree
Course Description	Introduction to surface water hydrology, hydrologic cycle. Hydrologic Principles. Precipitation, Evaporation, Infiltration and Soil Water Movement. Unit hydrograph, Flood hydrograph computation. Flood forecasting and frequency analyses; flood; Hydrologic simulation using HEC-HMS.
Prerequisites or Co-requisites	None
Course Learning Outcomes	Students completing this course successfully will be able to

Course Learning Outcomes	*Related Program Outcomes*
CLO1: Describe the main processes involved in surface water flow	**K1**
CLO2: Estimate measurement techniques for relevant data - advantages and Disadvantages	**S1**
CLO3: Compute different hydrological variables using models	**S1**
CLO4: Apply hydrology principles to solve hydrologic problems using computer programs (e.g. HEC-HMS, HEC-RAS, and Arc-GIS) on selected catchments in Saudi Arabia	**S1**
CLO5: Design and evaluate storm rainfall systems, hydrograph analysis and flow computation.	**C2**

Student Outcomes related to this Course	**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.

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<tr><td></td><td>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>
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<tr><th>List of Topics</th><th>Related CLOs</th></tr>
<tr><td>1. The hydrologic cycle, runoff mechanisms and water balances</td><td>CLO1</td></tr>
<tr><td>2. Rainfall data for hydrologic design</td><td>CLO1</td></tr>
<tr><td>3. Rainfall losses (interception, storage, infiltration)</td><td>CLO2</td></tr>
<tr><td>4. Stream flow (measurements and estimations)</td><td>CLO3</td></tr>
<tr><td>5. The runoff concentration (unit hydrograph, reservoir models)</td><td>CLO3</td></tr>
<tr><td>6. The overview of the different modelling techniques used in hydrology</td><td>CLO4</td></tr>
<tr><td>7. Flood routing (hydrologic methods)</td><td>CLO4</td></tr>
<tr><td>8. Storm drainage systems design and applications</td><td>CLO5</td></tr>
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<tr><td>Textbook(s) and Other Required Material</td><td>

Dingman, S. L., 1994. Physical Hydrology. Prentice Hall, GB 661.2 D56
Chow, V. T., Maidment, D. R., and Mays, L. W., 1988, Applied Hydrology, McGraw- Hill, GB 661.2 C43
Brutsaert, W., Hydrology an Introduction, Cambridge University Press, 2005
Introduction to Surface Water Hydrology Modelling, J. Nossent and A. van Griensven

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<tr><td>Grading System</td><td>Assignments 20%
Project Work 20 %
Midterm Exam 20%
Final Exam 40%</td></tr>
<tr><td>Instructors</td><td>Dr. Ibrahim Elsebaie /Dr. Raid Alharbi
E-mail: elsebaie@ksu.edu.sa Office 2A81</td></tr>
<tr><td>Date of Review</td><td>February, 2021</td></tr>
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