

1. CEE 4420 (5420) – Engineering Hydrology
2. Course credit hours: 3
Contact hours per week: 3
Credit category: Engineering Topics
3. Course coordinator: Alfred J. Kalyanapu
4. Textbook: Chin, A. D. (2013). *Water Resources Engineering. Third Edition.* Pearson Prentice Hall™, Upper Saddle River, New Jersey, ISBN: 9780132833219.

5. Course information:

2020 Catalog description	Fundamental processes in the hydrologic cycle, including precipitation, infiltration, and runoff. Quantitative approaches in engineering hydrology to estimate flows for a variety of design problems.
Prerequisite(s)	CEE 3420 or consent of instructor.
Course type	Selected Elective

6. Course instructional outcomes:

Course Outcome No.	Course Outcome (CO)	ABET Student Outcome
CO1	Estimate Water Budgets	1, 2
CO2	Calculate Transfer Processes in Hydrologic Cycle	1, 2
CO3	Characterize Catchment properties	1, 2
CO4	Apply Rational Method for Estimating Runoff in Small Catchments	1, 2
CO5	Apply NRCS method for Estimating Runoff in Small Catchments	1, 2
CO6	Perform Unit Hydrograph Analysis	1, 2
CO7	Perform Reservoir Routing	1, 2
CO8	Perform Hydrologic Channel Routing with Muskingum Method	1, 2
CO9	Design Stormwater systems	1, 2
CO10	Understand basic concept of Hydrologic Modeling	1, 2

ABET criterion 3 Student Outcomes addressed by this course:

SO No.	Student Outcome (SO)
3.1	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
3.2	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

7. Course topics:

1. Introduction (2.5%)
2. Water demand calculation (2.5%)
3. Water budget (10%)

4. Catchment properties (5%)
5. Rational method for estimating runoff (5%)
6. NRCS method for estimating runoff (5%)
7. Infiltration (15%)
8. Groundwater flow (2.5%)
9. Hydrologic Measurements (5%)
10. Unit Hydrograph (12.5%)
11. Reservoir Routing (10%)
12. Channel Routing (10%)
13. Stormwater systems (5%)
14. Rainfall-runoff modeling (10%)

Program criteria (curriculum) addressed by this course:

1. Apply knowledge of mathematics through differential equations, calculus-based physics, chemistry, and at least one additional area of basic science
 2. Analyze and solve problems in at least four technical areas appropriate to civil engineering
 3. Design a system, component, or process in at least two civil engineering contexts
8. Additional topics, assignments, or requirements for dual-level (4000/5000) course:
Independent research into hydrologic characterization and modeling of a medium-sized river basin.
9. Date: 01/24/2020