CEE 543
Hydrology

Catalog data:	20-CEE-543. Hydrology. 3 ug. cr. Hydrologic Cycle, Energy Balance, Precipitation, Evaporation, Infiltration, Baseflow, Runoff, Unit Hydrograph, Flood Routing, Frequency Analysis, Design Scale, Design Storms, Design Flows, Reservoir Sizing.
Prerequisites:	Fluid Mechanics (20-AEEM-383) & Hydraulic Systems (20-CEE-493/494)
Textbook:	Chow, Maidment & Mays (1988) *Applied Hydrology*, McGraw-Hill Book Co., New York.
References:	Some journal articles and extensive class handouts.
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Goals:	To introduce important physical processes, methods of analysis, and key design procedures used in engineering hydrology, particularly in problems related to quantifying and managing surface water resources.
Lecture or Lab Topics:	1. Hydrologic systems and Reynolds transport theorem (3 classes) 2. Atmospheric water, precipitation, evaporation (2 classes) 3. Infiltration and subsurface water (1 class) 4. Excess rainfall, runoff, and surface water (2 classes) 5. Unit hydrograph and SCS dimensionless hydrograph (2 classes) 6. HEC-HMS watershed Model (1 class) 7. Flow routing by level pool and Muskingum methods (2 classes) 8. Hydrologic statistics and flood frequency analysis (2 classes) 9. Design scale and hydro-economic risk analysis (1 class) 10. Design storms and intensity-duration-frequency curves (1 class) 11. Design flows, rational method (1 class) 12. Design of storm sewers and detention ponds (1 class) 13. Exam (2 classes, including final exam)
Computer Usage:	Students run HEC-HMS to analyze the 1990 flash flood at Shadyside, Ohio. This exercise synthesizes ideas from topics 1 through 7 and includes a substantial design component. In addition, students often use spreadsheet software to solve problems from weekly assignments.
ABET criterion 3:	a, c, e, h, i, k
ABET criterion 8:	a, b, g
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