Spring 2019
CEVE 419 - Flow Systems Design

Instructor:	Dr. Junke (Drinker) Guo, Dept. Civil Eng., PKI 204D
	Phone: 554-3873, E-mail: jguo2@unl.edu
When:	MW 9:00 AM – 10:15 AM
Where:	PKI 274
Date:	Jan 07, 2019 - May 03, 2019
Office hour:	TR 4:00 – 5:00 PM

Prerequisites: CIVE 326 or 327; CIVE 352

Textbook: *Fundamentals of Hydraulic Engineering Systems*, 5th Ed., Robert J. Houghtalen, A. Osman Akan, and Ned H. C. Hwang, Pretice Hall, ISBN-13: 978-0-13-601638-0

Objectives: Apply hydraulic principles to design water distribution systems, wastewater and stormwater collection systems, channelized flow systems, and treatment facilities.

Topics:
1. Pressure flow systems: Pipes and pumps
2. Conveyance systems: Open channel flow
3. Hydraulic structures

Outcomes: This course is contributing towards your education as follows:
1. Understand principles of mathematics, science and engineering.
2. Use appropriate modern techniques, skills and tools.
3. Communicate technically and effectively.
4. Understand the impact of engineering on global and societal issues.
5. Have knowledge of contemporary issues.

Computer Usage: Spreadsheets or MatLab

Final Grades:

97-100 A+,	93-96 A,	90-92 A-
87-89 B+,	83-86 B,	80-82 B-
77-79 C+,	73-76 C,	70-72 C-
67-69 D+,	63-66 D,	60-62 D-, **< 60 F**

Grade Breakdown:

Attendance	25%
Project #1: Pipe network design	25%
Project #2: Pump selection	25%
Project #3: Water surface profiles	25%

Homework: 3 projects will be assigned. You have to complete each before deadline. Late homework will not be accepted. If you have are not available to submit them, arrange to submit them early.

Final: No final.

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Date	Topic	Reference	Exercise
	#1: Introduction	Chapter 3	
	#2: United network flow model for water infrastructure systems		
	#3: Single pipe computation		
	#4: Pipe Network: Principle	Chapter 4	
	#5: Example: Network Computation		
	#6: Distribution System Design		
	Design Project I		
	#7: Pump: Simple Pump Computation	Chapter 5	
	#8: Systems Characteristics and Ideal Head Rise		
	#9: Pump Performance Characteristics		
	#10: Pump Selection (I)		
	#11: Pump Similarity Law		
	#12: Net Positive Suction Head		
	#13: Piping Systems Design and Pump Selection Procedure		
	Design Project II		
	#14: Open-Channel: Concepts and Variables	Chapter 6	
	#15: Rapid Varied Flow		
	#16: Open-Channel Flow Measurement		
	#17: Uniform Flow		
	#18: Specific Energy and Critical Flow		
	#19: Gradually Varied Flow		
	#20: River Network		
	#21: Software: HEC-RAS		
	Design Project III		
	#22: Urban Drainage Systems	Chapter 11	