CE 621 – Hydrology
NJIT Online Course

Fall 2017
Instructor: Trevor King, PE

Prerequisites: Undergraduate course in fluid mechanics.

Course Objective:
The course objective is to examine the statistical nature of precipitation and runoff data with emphasis on floods and droughts. The flow of groundwater is analyzed for various aquifers and conditions. Flood routing, watershed yield, and drainage problems are considered.

Course Texts:
***Principal text*:**
Bedient, P.B., W.C. Huber and B.E. Vieux., *Hydrology and Floodplain Analysis,* Fifth Edition, Pearson, 2012

Reference Texts:
Chow, V.T., *Handbook of Applied Hydrology*, McGraw-Hill Company, New York. 1964

Course Format: Most classes will be a lecture format supplemented with interpretative exercises in the principles of Hydrology. Homework problems will be assigned throughout the course. One mid-term exam and a final exam or project will be given.

***Honor Code:** Students are advised that the NJIT Honor Code will be upheld in this course, and any violations will be brought to the immediate attention of the Dean of Students.

Homework: Submit by 11:00 PM on Tuesday of the following week, unless stated otherwise.

Course Grading Basis: Homework Assignments = 30%; Midterm Exam = 30%; and Final Exam: 40%

Instructor Contact: Cell: 215-384-4829; tking@njit.edu
Office hours: Sunday 2:00-4:00 pm.

Course Outline: *Please see next page.* Students will be consulted on any substantial changes to the course syllabus. Changes will be announced in advance.

The final grade will be based upon the following percentages using the total net points achieved by the student:

A:	93 to 100%	B+:	87 to 92%	B:	83 to 86%	C+:	77 to 82%
C:	72 to 76%	D:	67 to 71%	F:	Below 67%		

Other Items:
1. Review of class slides is RECOMMENDED to ensure concepts are understood.

Week	Date	CE 621 Hydrology Lecture Topics
1	Sept. 5	**Introduction** • About Instructor • Class Members • **Topic 1a**. Overview, History and Engineering Applications • **Topic 1b**. Properties of Water and Hydrologic Cycle • **Topic 1c**. Introduction to Global Water Cycle
2	Sept. 12	**Hydrologic Principles** • **Topic 2a.** Forms of Precipitation • **Topic 2b**. Precipitation Measurement
3	Sept. 19	**Hydrologic Principles (cont.)** • **Topic 3a.** Runoff and Infiltration • **Topic 3b.** Evaporation • **Topic 3c.** Transpiration • **Topic 3d.** Interception and Depression Storage
4	Sept. 26	**Basin Hydrologic Analysis** • **Topic 4a.** Watershed Concepts • **Topic 4b.** Water Balance Equation • **Topic 4c.** Water Budgets • **Topic 4d.** "Safe Yield" Determination
5	Oct. 3	**Streamflow Measurement and Analysis** • **Topic 5a**. Concept of Stage • **Topic 5b**. Methods of Measurements • **Topic 5c.** Stream Gaging Networks, e.g. NJ • **Topic 5d.** Rating Curves
6	Oct. 10	**Hydrographs and Frequency Analysis** • **Topic 6a**. Probabilistic Concepts • **Topic 6b**. Return Periods and Recurrence Interval • **Topic 6c.** Unit Hydrograph Development • **Topic 6d.** Detention Approaches
7	Oct. 17	**Floodplain Hydraulics and Regulations** • Structural approaches for flood protection • Non-structural approaches for flood protection
8	Oct. 24	**MIDTERM EXAM (due midnight of Sunday Oct. 29)**
9-10	Oct. 31, Nov. 7	**Flood Routing; Severe Storm Impacts**
11	Nov. 14	**Hydrologic Modeling and Design** • Various Methods (Rational, SCS, etc.) • StreamStats
12	Nov. 21	**Groundwater Hydrology**
13	Nov. 28	**Urban Hydrology.** Soil Erosion and Sediment Control
14	Dec. 5	**Water Quality Issues** • Point and Non-point Pollution Sources • Watershed Best Practices
15	Dec. 12	**Final Exam or Project. Due by Dec 18**