Upon completion of this course, students will be able to:

- Identify and formulate all fundamental parameters to be considered in engineering hydrology analysis and design
- Understand the fundamental concepts and principals involved in engineering hydrology
- Apply the major definitions and theorems as well as all pertaining fundamental equations and models both for analysis and design purposes
- Design a real-scale project using basic and advanced models for pre- and post-development conditions with the help of well-known software packages.
- Present the project in a professional and scientifically acceptable manner.

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**Grading Policy:**

- **Exams - Midterm:** 30%
- **Final:** 30%
- **Project - Report:** 20%
- **Presentation:** 10%
- **Homework:** 10%
- **Bonuses:** 4% for each set of exam notes
  
  4% for class review presentation

**Class review:** During the first 5 minutes of each class, 2 pre-selected students will present a synopsis of the material covered in the previous class. Students may use PowerPoint or other means of electronic presentations. Along with the presentation students should submit a copy of their class notes for the material covered in the presentation. Students may receive up to 4 bonus points for their class review presentation.

**HW Assignments:** Homework assignments are an important part of the learning process: they reinforce both concepts and computational skills. Be sure to allocate sufficient time. Although you are welcome and encouraged to discuss assignments with other students or with the instructor or graduate assistant, you must first make an effort to solve each problem by yourself. After any discussions about specific problems, you should prepare your assignment submitted independently – copied solutions violate the spirit of the learning process and the NYU-Poly Code of Conduct and appropriate academic dishonesty reporting will be implemented.

Homework should be submitted on 8½x11-inch paper - either engineering computation paper (preferred) or lightly-ruled graph paper. Cover pages are not required. All pages should be consecutively numbered and the entire assignment must be stapled at the top left corner. On the top right corner of the first page of your homework include your full name, homework assignment number, problems solved partially and problems solved completely along with the date of submission. Underline your answers. Use proper graph paper for all graphs, sketches, designs, etc. which meet engineering standards. **The overall appearance of your submittals is very important.** Loose-leaf or other horizontally-ruled paper is not recommended as they are not standard in professional use. Computational problems can be done by hand as long as handwriting is legible. See a sample assignment report below.

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## Problem 2-5

**SOLUTION...**

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**Course No. and name:** CE-AB 0000  
**Student's Name:** Vasileiadis, Haietambos V  
**Assignment Number:** Assignment 4  
**Problem(s) assigned:** Ch 2 - 5, 7, 9, 11  
**Problem(s) solved completely:** Ch 2 - 5, 7  
**Problem(s) solved partially:** Ch 2 - 11  
**Problem(s) not solved:** Ch 2 - 9  
**Due date:** mmd/d/yyyy  
**Date submitted:** mmd/d/yyyy  

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**Calibration curve of fluorescence measurements of Substance A using Fluorimeter B**

**Answer:** 16.1 AU

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In order to complete this task, human intervention is essential to understand and to make decisions. A detailed topographic map will be provided to perform this task. Though there are some software programs available nowadays to perform this task, human intervention is essential to understand and to make decisions. The implementation of flood control measures (ex., construction and operation of a detention pond) is required to eliminate/minimize all associated adverse effects.

In order to complete this project, you would need to:

1. Work in groups of 4 or 5. Active participation of all is required.
2. Get familiar with the map, the topographic characteristics and identify the existing culvert.
3. Delineate the existing (without any development) and future (after development) catchment area that contribute to the existing culvert.
4. Obtain all necessary meteorological, hydrological and geological information for the site. This includes determination of soil type(s), precipitation pattern (intensity, return period and duration), infiltration rate, other losses, etc.
5. Perform calculations (manually and/or with the use of software programs) using well recognized scientific procedures to estimate the surface runoff characteristics for the following three scenarios:
   a. Existing (without any development)
   b. Proposed (after development but without the implementation of any flood control measures)
   c. Proposed (after development and with the implementation of all necessary flood control measures). The technical characteristics/specifications of all implemented flood control measures should reduce the peak flow rate to the existing culvert at levels equivalent to the existing condition (zero increase tolerance).
6. Develop hydrographs for all three scenarios and compare their characteristics including peak runoff rates and their corresponding chronological sequences.
7. Determine the minimum required storage for a detention pond for a maximum depth of 6 feet and the corresponding surface area. Search for alternative flood control measures, compare them and discuss your findings.
8. Identify the optimal location and shape for such detention pond. Discuss all criteria involved to define the optimal one.
9. Design the detention pond along with all associated hydraulic structures and systems. For design specifications you may refer to the New York State Stormwater Management Design Manual, NYS Department of Environmental Conservation, August 2010.
10. Prepare a group report and a 15-minute presentation. The presentation will take place in the last lecture of the semester. Your project will be graded based on the report (follow the guidelines and format of scientific papers published in established journals, such as the ASCE journals), the presentation material (format, completeness, clarity) and your presentation performance.
Recommendation(s):

Use the Hydrologic Engineering Center - Hydrologic Modeling System, HEC-HMS [HEC-HMS has been developed by the United States Army Corps of Engineers – Hydrologic Engineering Center and can be downloaded from http://www.hec.usace.army.mil/software/hec-hms/] in conjunction with the following references (all references will be posted on the blackboard):

- New York State Stormwater Management Design Manual, New York State Department of Environmental Conservation, August 2010,
- Urban Hydrology for Small Watersheds, Technical Report 55 [TR-55], U. S. Department of Agriculture – Natural Resources Conservation Service (NRCS), June 1986; use it to provide calculations for a pre- and post-development site with and without a proposed detention pond (steps 5 and 6, as listed above),
- Rainfall Frequency Atlas of the United States for Durations from 30 Minutes to 24 Hours and Return Periods from 1 to 100 Years [TP-40], U. S. Department of Commerce – Weather Bureau, May 1961; you may also use http://precip.eas.cornell.edu/
- Soil group data (step 4) can be obtained from the U. S. Department of Agriculture (USDA) - Natural Resources Conservation Services (NRCS) webpage http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm. Web Soil Survey (WSS) provides soil data and information produced by the National Cooperative Soil Survey. It is operated by the USDA Natural Resources Conservation Service (NRCS) and provides access to the largest natural resource information system in the world.

Search for similar programs and procedures, compare them and discuss their characteristics (limitations and advantages).

Project map:
Project Reports: All reports should be single spaced manuscripts with a minimum of 5 references to be listed at the end of the manuscript. Figures and tables can be scanned if appropriately referenced. Use only 8½” x 11” paper.

No cover pages are needed. Staple (or otherwise secure) all pages at the top left corner. Use proper graph paper for all graphs, sketches, designs, etc. which meet engineering standards. The overall appearance of your submittals is very important. All technical papers/reports should adhere to the ASCE guidelines for publication [http://ascelibrary.org/doi/pdf/10.1061/9780784479018]. You may use either international (SI) or English (EU)
School of Engineering Policies and Procedures on Academic Misconduct

Common examples of academically dishonest behavior include, but are not limited to:

1. Cheating: working together on work that was meant to be done individually.
2. Fabrication: working together on work that was meant to be done individually.
3. Plagiarism: intentionally or knowingly representing the words or ideas of another as one’s own in any academic exercise; failure to attribute direct quotations, paraphrases, or borrowed facts or information.
4. Unauthorized collaboration: working together on work that was meant to be done individually.
5. Duplicating work: presenting for grading the same work for more than one project or in more than one class, unless express and prior permission has been received from the course instructor(s) or research adviser involved.
6. Forgery: altering any academic document, including, but not limited to, academic records, admissions materials, or medical excuses.