ENVE 3003 – GEOG 4103 Water Resources Engineering

Topic
1. Introduction, aspects of water resources engineering, global and regional water quantities, hydrologic cycle, water budget analysis, Canadian legislation
2. Probability Concepts in Water Resources, return periods, risk, reliability, probability distributions, analysis of hydrologic data, frequency analysis
3. Precipitation/Rainfall, generation and distribution, intensity and duration, IDF curves, design rainfall, snow, extreme rainfall events
4. Rainfall Abstractions, interception, depression storage, infiltration, Horton and Green-Ampt models, evapotranspiration
5. Hydrologic Time Series Analysis, stochastic time series, simple Markov models for river flows
6. Runoff Models, time of concentration, peak-runoff models, Rational Method, continuous-runoff models, hydrographs, unit hydrograph, time-area model
7. Routing Models, Modified Puls method, Muskingum method, hydraulic routing for reservoirs
8. Stormwater Management, stormwater quality, design flows, flood control, water-quality control, best management practices
9. Groundwater Resources, distribution and measurement, aquifer properties, well hydraulics, superposition, image wells
10. Water Resources Planning and Management, water supply, floodplain management, drought management, irrigation, dams and reservoirs

Required Texts

Reference Texts
Water Resources Engineering, Ralph A. Wurbs and Wesley P. James

Lecture Notes
Provided on cuLearn

Marking Scheme
Assignments and lab  20 %
Midterm  30 %
Final  50 %
Please note: Final exam papers will not be returned to students.

**Academic Accommodation**

You may need special arrangements to meet your academic obligations during the term. For an accommodation request the processes are as follows:

**Pregnancy obligation:** write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details see the [Student Guide](#).

**Religious obligation:** write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details see the [Student Guide](#).

**Academic Accommodations for Students with Disabilities:** The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your Letter of Accommodation at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). Requests made within two weeks will be reviewed on a case-by-case basis. After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website (www.carleton.ca/pmc) for the deadline to request accommodations for the formally-scheduled exam (if applicable).
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