MORRISVILLE
EST. 1908
STATE UNIVERSITY OF NEW YORK

School of Agriculture,
Business, and Technology

AGEN 151
Applied Hydraulics for Hydropower Generation
Spring 2021

First Examination Study Guide

Prepared By

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- Have a basic understanding of MS Excel (as covered in the class)
- Understand the advantages and disadvantages of hydropower generation
- Understand the hydropower generation basics
- Understand how the hydrologic cycle affect hydropower generation
- Know the basic components of a small-scale hydropower system
- Know the basic units for length, mass, force, pressure, work, and power in the British Gravitational and SI systems of units
- Understand the concept of water pressure in pipe systems and how it is measured
- Understand the approaches to problem solving as discussed in class
- Know the difference between kinetic, potential, and pressure energies
- Convert between pressure in psi and head in feet (and vice versa)
- Know how to work with pressure and head under static and dynamic conditions
- Understand how to apply the conservation of energy principle (Bernoulli's equation) in pressurized pipe flow
- Understand the effect of pipe material, pipe diameter, pipe length, and flow velocity on head losses due to friction
- Know the different types of pipes presented in the laboratory, their primary characteristics, common uses, and fitting methods
- Understand the system to follow in naming any given pipe fitting
- Know the names of the standard pipe fittings introduced in the laboratory
- Know the approaches to follow in assembling pipes and fittings of different materials
- Know the common equipment/tools used in assembling pipes and fittings as demonstrated in the laboratory

$$h_l = h_f + h_{minor} \qquad Z_1 + h_1 + \frac{V_1^2}{2g} \pm h_m - h_f - Z_2 \pm h_l + \frac{V_2^2}{2g} \qquad h_{minor} = K\frac{V^2}{2g}$$

$$h_f = function\left(L, V^{1.85}, \frac{1}{D^{4.87}}, \frac{1}{C^{1.85}}\right)$$

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Last Modified: January 22, 2021