

Centralia College
 Hydro Electricity
 PPO 208APP, (6252)
 Winter 2017

Location: Arranged
Time:

Class Start: Jan 3, 2017
Class Stop: March 16, 2017

Instructor: Rulon Crawford, MBA
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Office hours are Mon 8:00 noon, Wed. 8:00 – noon, Thurs. 8:00 - noon

Course Description

An introductory study of how electricity is generated from hydro dams. Prerequisite is successful completion of PPO 103. We will discuss the types of dams, types of turbines, hydro regulations, safe fish passage, environmental impacts of dams, and water quality.

Course Role to Program

Successful course completion gives the student an understanding of hydro electricity as a basis for knowing how it can be generated and distributed safely and efficiently.

Course Outcomes

Upon successful completion students should be able to:	Method of Assessment
Explain the terms CFM, Penstock, Tail Race, and Pressure	H, E
Explain the difference between types of dams	H, E
Explain the difference between the different types of turbines	H, E
Understand how a generator and transformer work	H, E
Explain how a generator is synchronized with the grid	H, E
Explain the licensing requirements and the agencies involved	H, E
Understand and explain how fish migrate through dams	H, E
Explain how oxygen, sediment, and temperature affect fish	H, E
Discuss the types of jobs available in hydro electricity production	H, E
Explain the concept of load on the transmission grid	H, E

Method of Assessment Key:

H = Homework

E = Quizzes & Exams

R = Lab reports or technical writing

W = Research papers or creative writings

P = Performance, presentation, or demonstration of a skill

Book

No book required. Handouts will be given in electronic format which you will need to print out.

Other required material

The following are required materials for the course and need to be with you at each class:

- Calculator with a square root function button
- Note paper
- Pencils

Assignments Due and Late Policy

All assignments are to be completed prior to the class in which they appear.

Assignments are late if not submitted on or before the due date. A 10-point penalty will be assessed for all late work. No assignment will be accepted after one week following its due date.

Grading Distribution

Category	Weight
Class participation/Teamwork/Attendance	20%
Homework	20%
Project	20%
Mid-term Exam	20%
Final Exam	20%

Homework and Assignments

Each week assignments will be given which may include reading, problems, reports, and online exercises. A person will be required to receive and submit all assignments through "Canvas."

Project

This project will be introduced in class.

Expectations for quizzes, Exams, and Assignments

- Academic honesty is expected. Use citations when appropriate. Plagiarism is grounds for a failing grade.
- Quizzes and Exams: the information gathered will be considered proprietary to each student. In other words, teamwork will be stressed but not during quizzes and exams.
- All items will be scored on a base of 100% for final weighting into grade.

Written

- Any formal papers should be typed double spaced in easily read 12 point fonts with 1" margins on all sides.
- Misspellings, inappropriate punctuation, grammar, usage, syntax etc., will negatively impact your grade. Relying on spell-check is often risky; use a dictionary or other resource.

Online

- Access to a computer either at home or at the school with internet connection is required for the course. Software required will be MS Word and Adobe Acrobat Reader (which is available for free).

Course Outline

(Subject to change by the Instructor)

Week	Content	Assignment/Exam
(1)	Hydro Basics	Homework #1
(2)	Types of Dam Structures	Homework #2
(3)	Turbines	Homework #3
(4)	Generators and Transformers	Homework #4
(5)	Power System Operations	Homework #5
(6)	Hydro Project Regulations	Project
(7)	Tour	Homework #6
(8)	Fish Passage	Homework #7
(9)	Water Quality	Homework #8
(10)	Types of Jobs	Homework #9
(11)	Final	Homework #10

Grading information

%	Grade
95+	A (4.0)
91-94	A- (3.75)
87-90	B+ (3.5)
83-86	B (3.0)
80-82	B- (2.75)
77-79	C+ (2.5)
73-76	C (2.0)
70-72	C- (1.75)
67-69	D+ (1.5)
64-66	D (1.0)
<64	F (0)

Special Needs Statement:

Students with disabilities may contact the Director of Special Services to determine their eligibility for reasonable accommodation. The director's office is located with the Counseling Center in the Student Services Building.

Copyright Notice:

Materials used in connection with this course may be subject to copyright protection under Title 17 of the United States Code.

Equal Opportunity Statement

It is the policy of Centralia College to assure equal employment opportunity and non-discrimination on the basis of race or ethnicity, creed, color, national origin, sex, marital status, sexual orientation, age (over 40), religion, the presence of any sensory, mental, or physical disability, or status as a disabled or Vietnam-era veteran.

Centralia College does not discriminate in admission or access to, or treatment or employment in, its programs or activities. Designated Title II, VI, VII, IX, Section 504, ADA compliance officer: Vice President for Human Resources and Legal Affairs, Hanson Hall Room 101, Centralia College, 600 Centralia College Blvd, Centralia WA 98531-4099, 360.736.9391, extension 285.

Extended Absence

Should a contagious illness, such as the H1N1 virus, necessitate an extended absence from class, please contact your instructor as soon as possible to make arrangements to complete, if possible, the coursework you miss.