MINNESOTA WEST COMMUNITY & TECHNICAL COLLEGE
COURSE OUTLINE

DEPT. ELUT **COURSE NUMBER: 1115**

NUMBER OF CREDITS: 3 **Lecture: 2 Lab: 1 OJT 0**

Course Title:
Generation, Transmission and Distribution

Catalog Description:
Generation, Transmission and Distribution is designed to simulate the Power Industry. Through the use of laboratory projects, the student will receive background in understanding the concepts of generation, transmission and distribution of electric power.

Prerequisites or Necessary Entry Skills/Knowledge:
None

FULFILLS MN TRANSFER CURRICULUM AREA(S)

☐Goal 1: Communication: By meeting the following competencies:
☐Goal 2: Critical Thinking: By meeting the following competencies:
☐Goal 3: Natural Sciences: By meeting the following competencies:
☐Goal 4: Mathematics/Logical Reasoning: By meeting the following competencies:
☐Goal 5: History and the Social and Behavioral Sciences: By meeting the following competencies:
☐Goal 6: The Humanities and Fine Arts: By meeting the following competencies:
☐Goal 7: Human Diversity: By meeting the following competencies:
☐Goal 8: Global Perspective: By meeting the following competencies:
☐Goal 9: Ethical and Civic Responsibility: By meeting the following competencies:
☐Goal 10: People and the Environment: By meeting the following competencies:

Topics to be Covered
Simple rules of safety
Phase sequence of a three-phased line, real, apparent, and reactive power
Phase angle between the voltages at the sending and receiving ends of a transmission line
The effects of resistance, inductance, and capacitance on an electrical line
The effects of powerfactor and ways to correct it.
Power generation and consumer access

Student Learning Outcomes
Use the functions sine, cosine, and tangent, which define the relationship between real, reactive and apparent power.

Explain effective resistance in an ac circuit and show how eddy current losses and hysteresis losses cause effective resistance to be greater than the true ohmic resistance.
Solve series circuit problems involving resistance, inductive reactance, and capacitive reactive components, making use of the appropriate formulas.
Develop vector diagrams showing the relationship between the voltage across the R, X_L, X_C components and the applied line voltage.
Connect single-phase R loads, X_L loads, X_C loads, and other electrical devices, using wye connection and the delta connection, to form three-phase circuits.
Calculate the power (in volt-amperes), the true power (in watts), and reactive power (vars) in three-phase systems.

Is this course part of a transfer pathway: Yes ☐ No ☒

Revised Date: October, 2020