Faculty members are required to have the outline submitted to the Academic Affairs Office. The course outline is the form used for approval of new courses by the Academic Affairs and Standards Council.

DEPT. ELUT COURSE NUMBER: 1115

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

Course Title: Generation, Transmission and Distribution

Catalog Description:
This course 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 power factor and ways to correct it.
- Power generation and consumer access

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
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<tr>
<td>1. Use the functions sine, cosine, and tangent, which define the relationship between real, reactive and apparent power.</td>
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<td>2. 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.</td>
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<td>3. Solve series circuit problems involving resistance, inductive reactance, and capacitive reactive components, making use of the appropriate formulas.</td>
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<td>4. Develop vector diagrams showing the relationship between the voltage across the R, X&lt;sub&gt;L&lt;/sub&gt;, X&lt;sub&gt;C&lt;/sub&gt; components and the applied line voltage.</td>
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<tr>
<td>5. Connect single-phase R loads, X&lt;sub&gt;L&lt;/sub&gt; loads, X&lt;sub&gt;C&lt;/sub&gt; loads, and other electrical devices, using wye connection and the delta connection, to form three-phase circuits.</td>
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<td>6. Calculate the power (in volt-amperes), the true power (in watts), and reactive power (vars) in three-phase systems.</td>
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Is this course part of a transfer pathway: Yes ☐ No ☒

Revised Date: October, 2020