

**Eastern West Virginia Community and Technical College  
COURSE ASSESSMENT REPORT**

<b>Course Title and Number:</b> Power Generation & Transmission, WTT 160	<b>Academic Term and Year of Assessment Activity (Ex: Fall, 2014):</b> Spring, 2019
<b>Report Submitted By:</b> E. Putze	<b>Number of Students Assessed:</b> 7
<b>Date Report Submitted:</b> 8-2-2019	<b>Number of Sections Included:</b> 1
<b>Course Delivery Format (list all modalities used in sections assessed. Ex: web based, VDL, traditional section, hybrid course, etc.):</b> Lab exercises with hands-on training and computer applications, lectures, reading, web-based assignments, one-on-one instruction	

**Course Role in the Curriculum**

**Provide a description of the role the course serves in the curriculum (i.e. general education requirement, program technical core, restricted elective, etc.). Note all as appropriate.**

Role in College Curriculum: Technical Core for Wind Energy Technology, AAS

Catalog Description: This course is a study of the components and process of electrical power generation, control, and delivery systems for wind energy. This course will serve as the basis for an understanding of power generation and distribution. Students will learn how power is transported from the wind farm to homes and businesses. Troubleshooting techniques and procedures will be discussed and demonstrated. This course will cover working with very high voltage transmission equipment and safety procedures.

**Assessment Methods**

**Provide a description of the assessment process used. Include description of instrument and performance standards in description. Note all methods.**

Lab Exercises: Festo Lab-Volt's *AC Power Transmission Training System* was used for lab exercises. The following topics were covered: *3-phase AC Power Circuits, 3-phase Transformer Banks, & AC Transmission Lines*. The instructor was present throughout all labs; facilitated learning through demonstration, lectures, and interaction with students; and observed student performance. Assembling circuitry from diagrams, individually and in teams; demonstration and operation of circuits and measuring tools; analysis and interpretation of results; and computation were all demonstrated by students and assessed by the instructor.

Written Tests: Written tests, which were primarily multiple choice, were based mostly on material in *Electric Power System Basics for the Nonelectrical Professional*; author: Steven W. Blume; publisher: John Wiley & Sons, Inc.; 2007. Lectures and web-based Blackboard assignments were utilized to enable learning. Selected questions from the five tests given were used for assessment.

Hands-On Tests: Each student was required to assemble electrical circuits, configure electronic measuring tools, analyze and interpret results, and understand vocabulary.

<b>Assessment Results</b>			
<b>Provide a summary of results including tables/charts. Incorporate information from previous assessments as appropriate. Append additional pages if necessary. If appending, include notation in box to "See attached".</b>			
<b>Course Outcome &amp; Indicator</b>	<b># of Students Answering Correctly</b>	<b># of Students Answering Incorrectly</b>	<b>Composite</b>
1(a)	5.0	2.0	7.0
1(b)	3.0	4.0	7.0
1(c)	3.0	4.0	7.0
2(a)	7.0	0.0	7.0
2(b)	5.0	2.0	7.0
2(c)	3.0	3.0	6.0
3(a)	6.0	1.0	7.0
3(b)	5.0	2.0	7.0
3(c)	7.0	0.0	7.0
4(a)	4.0	2.0	6.0
4(b)	3.0	3.0	6.0
4(c)	6.0	0.0	6.0
<b>Total Answers</b>	<b>57.0</b>	<b>23.0</b>	<b>80</b>
<b>Percentage</b>	<b>71.25%</b>	<b>28.75%</b>	<b>100%</b>
Six students assessed on course outcomes 2(c), 4(a), 4(b), & 4(c); seven students assessed on all other course outcomes.			

<b>Course Level Assessment Summary of Outcomes, Indicators and Results</b>				
<b>Add additional rows to table if necessary</b>				
<b>Learning Outcomes (Insert learning outcomes assessed during this cycle)</b>	<b>Indicator (Insert indicators used for each outcome: exam question, scoring rubric, etc. Be specific)</b>	<b>Percent of Correct Responses</b>	<b>Percent of Incorrect Responses</b>	<b>Performance Standard Met (75%)* (yes or no)</b>
Learning Outcome 1: <i>Understanding of power and how power is generated</i>	(a) <u>Test #1, Question # 3 (T/F):</u> "Electric power systems store electrical energy for later use." <u>Answer: "False"</u>	71.43%	28.57%	No
Learning Outcome 1:	(b) <u>Test #1, Question #12 (M/C):</u>	42.86%	57.14%	No

<i>Understanding of power and how power is generated</i>	<p>“Electric generators and motors operate on the principle of magnetic:”</p> <p><u>Answer:</u> “Induction”</p>			
<p>Learning Outcome 1:</p> <p><i>Understanding of power and how power is generated</i></p>	<p>(c) <u>Test #2, Question #11</u> (M/C):</p> <p>“High-voltage power lines are used to allow for a(n) _____ in current for an equal amount of power:”</p> <p><u>Answer:</u> “Decrease”</p>	42.86%	57.14%	No
<p>Learning Outcome 2:</p> <p><i>Understand single and three phase power systems</i></p>	<p>(a) <u>Test #1, Question #14</u> (M/C):</p> <p>“AC voltage generation using three coils produces 3 electrical phases that lag one another by:”</p> <p><u>Answer:</u> “120°”</p>	100%	0%	Yes
<p>Learning Outcome 2:</p> <p><i>Understand single and three phase power systems</i></p>	<p>(b) <u>Test #2, Question #16</u> (M/C):</p> <p>“Three single-phase transformers operating as a single unit are called:”</p> <p><u>Answer:</u> “Banked”</p>	71.43%	28.57%	No
<p>Learning Outcome 2:</p> <p><i>Understand single and three phase power systems</i></p>	<p>(c) <u>Test #4, Question #16</u> (M/C):</p> <p>“Which type of relay is used to ensure that frequency, voltage, phase angle, and rotation requirements are met before</p>	50.0%	50.0%	No

	<p>circuit breakers are closed to connect two three-phase systems together.”</p> <p><u>Answer:</u> “Permissive”</p>			
<p>Learning Outcome 3:</p> <p><i>Demonstrate circuit theory and use of schematics to analyze circuits</i></p>	<p>(a) <u>Test #1, Question #1 (M/C):</u></p> <p>“Ohm’s Law is:”</p> <p><u>Answer:</u> “Voltage equals Current times Resistance”</p>	85.71%	14.29%	Yes
<p>Learning Outcome 3:</p> <p><i>Demonstrate circuit theory and use of schematics to analyze circuits</i></p>	<p>(b) <u>Test #1, Question #6 (M/C):</u></p> <p>“Electric potential is measured in:”</p> <p><u>Answer:</u> “Volts”</p>	71.43%	28.57%	No
<p>Learning Outcome 3:</p> <p><i>Demonstrate circuit theory and use of schematics to analyze circuits</i></p>	<p>(c) <u>Test #1, Question #8 (M/C):</u></p> <p>“Electrons flowing in a conductor is called:”</p> <p><u>Answer:</u> “Current”</p>	100%	0%	Yes
<p>Learning Outcome 4:</p> <p><i>Discuss fusing and circuit protection equipment</i></p>	<p>(a) <u>Test #4, Question #8:</u></p> <p>“A distribution feeder typically has a total of:”</p> <p><u>Answer:</u> “Four overcurrent relays”</p>	66.67%	33.33%	No

<p>Learning Outcome 4: <i>Discuss fusing and circuit protection equipment</i></p>	<p>(b) <u>Test #4, Question #9:</u> “Which type of relay is used to help prevent a cascading outage?”  <u>Answer:</u> “Under-frequency”</p>	<p>50.0%</p>	<p>50.0%</p>	<p>No</p>
<p>Learning Outcome 4: <i>Discuss fusing and circuit protection equipment</i></p>	<p>(c) <u>Test #4, Question #15:</u> “Which type of relay is used to safely connect a three-phase generator to a three-phase system?”  <u>Answer:</u> “Synchronizing”</p>	<p>100%</p>	<p>0%</p>	<p>Yes</p>
<p>Six students assessed on course outcomes 2(c), 4(a), 4(b), &amp; 4(c); seven students assessed on all other course outcomes.</p>				

\* Please note if using a different minimum performance standard.

<p><b>Conclusions</b></p> <p><b>Provide a brief summary of conclusions derived based on analysis of data. Append additional pages if necessary. If appending, include notation in box to “See attached”.</b></p>
<p>The performance standard of 75% was exceeded on four out of twelve questions spread over the four Learning Outcomes assessed. On three different questions, 70% was exceeded, and 60% was exceeded on one other question, resulting in a total of eight out of twelve questions exceeding 60%. The overall is 71.25%.</p>

<p><b>Previous Assessment Reports and Results</b></p> <p><b>Date of Previous Assessment:</b> Spring, 2017  <b>List of Outcomes Not Met:</b> Performance standard of 75% exceeded for all Learning Outcomes  <b>Summary of Actions Taken to Address Unmet Learning Outcomes:</b> Append additional pages if necessary. If appending, include notation in box to “See attached”. N/A  N/A</p>
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**Action Plan and Date for Reassessment**

**Identify action plan for improvement or maintaining current performance levels including outcomes identified for re-assessment, curriculum revision, LOT proposal, new or revised course activities to reinforce learning outcomes, etc. Append additional pages if necessary. If appending, include notation in box to “See attached”.**

Will better emphasize important principles in lectures.

**Assessment Committee Recommendation/Approval  
(To be posted by Assessment Committee Chair)**

- Approved as presented
- Approved with recommendations for future reports (Explanation Required)
  - Use current template
  - Present Assessment Results in a more familiar and accessible format
  - Include more detail in the Action Plan which addresses any specific shortcoming(s)
- Resubmission Required. Reason for Resubmission:

**Date: 9/13/19**