

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

<b>Course Title and Number:</b> Maintenance Applications, ELM 218	<b>Academic Term and Year of Assessment Activity (Ex: Fall, 2014):</b> Fall, 2018
<b>Report Submitted By:</b> E. Putze	<b>Number of Students Assessed:</b> 2
<b>Date Report Submitted:</b> 2-6-2019	<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 work, reading, Blackboard assignments, written exercises, demonstrations, lecture	

<b>Course Role in the Curriculum</b>
<b>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.</b>
<u>Role in College Curriculum:</u> Technical Core or Restricted Elective for Wind Energy Technology
<u>Catalog Description:</u> This course introduces the student to a comprehensive coverage of maintenance troubleshooting principles, procedures and practices used in maintaining industrial systems. Electrical, refrigeration, boiler, HVAC, mechanical and fluid power systems will be studied. Safety, services and repair principles and practices will be covered.

<b>Assessment Methods</b>
<b>Provide a description of the assessment process used. Include description of instrument and performance standards in description. Note all methods.</b>
<u>Lab Exercises &amp; Demonstrations:</u> LabVolt electrical, power generation & transmission, motors, and hydraulics & pneumatics hands-on trainers were used for lab exercises and demonstrations. The following topics were covered: electricity & circuits, electric motors, electricity generation and transmission, safety procedures and equipment, thermal cameras, hydraulic and pneumatic systems, and programmable logic controllers. The instructor was present throughout all labs; facilitated learning through demonstration and interaction with students; and observed student performance.
<u>Written Exercises &amp; Blackboard Assignments:</u> The following topics were covered by reading assignments, written exercises, and Blackboard assignments: electricity & circuits, electric motors, vibration analysis, lubrication analysis, electricity generation and transmission, power supplies, troubleshooting, safety procedures and equipment, thermal cameras, data acquisition, maintenance management, simple machines, hydraulic and pneumatic systems, boilers, refrigeration, compressors, transducers, piping systems, fans, and programmable logic controllers.
<u>Written Tests:</u> Written tests, which were primarily multiple choice, were based on the material covered in the lab exercises, demonstrations, reading, written exercises, Blackboard assignments, and lectures, all of which were utilized to enable learning. Selected questions from the three tests given were used for assessment.

<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)	2	0	2.0
2(a)	2	0	2.0
3(a)	2	0	2.0
3(b)	2	0	2.0
4(a)	1	1	2.0
4(b)	2	0	2.0
5(a)	2	0	2.0
5(b)	2	0	2.0
5(c)	2	0	2.0
<b>Total Answers</b>	<b>17</b>	<b>1</b>	<b>18</b>
<b>Percentage</b>	<b>94.44%</b>	<b>5.56%</b>	<b>100%</b>

<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>Understand how to utilize a computerized maintenance monitoring system (CMMS)</i>	(a) <u>Test 2, Question #17</u> (M/C): "Computerized Maintenance Management Systems (CMMS's) can help a business with all of the following except:"  <u>Answer:</u> "Increasing productivity by troubleshooting ladder diagrams"	100%	0%	Yes
Learning Outcome 2:  <i>Demonstrate a knowledge of vibration analysis</i>	(a) <u>Test 3, Question #9</u> (M/C): "A _____ vibration analysis made when the machine is functioning properly provides a comparison for future readings."	100%	0%	Yes

	<u>Answer: "Baseline"</u>			
Learning Outcome 3:  <i>Describe how single and three phase electricity is generated and transmitted</i>	(a) <u>Test 1, Question #4</u> <u>(M/C):</u> "The phases of three-phase AC are electrically separated from each other by:"  <u>Answer: "120°"</u>	100%	0%	Yes
Learning Outcome 3:  <i>Describe how single and three phase electricity is generated and transmitted</i>	(b) <u>Test 2, Question #6</u> <u>(M/C):</u> "Which of the following are used to maintain receiver voltage within minimum and maximum voltage limits"  <u>Answer: "Switched shunt inductor banks" &amp; "Switched shunt capacitor banks"</u>	100%	0%	Yes
Learning Outcome 4:  <i>Understand how to utilize and maintain industrial programmable controller systems</i>	(a) <u>Test 2, Question #39</u> <u>(M/C):</u> "What is the purpose of the Examine If Closed (XIC) Motor Forward input on Rung 2:"  <u>Answer: "To hold Motor Forward output "on" after PB1 is released"</u>	50%	50%	No
Learning Outcome 4:  <i>Understand how to utilize and maintain industrial programmable controller systems</i>	(b) <u>Test 2, Question #40</u> <u>(M/C):</u> "What is the purpose of the Examine If Open (XIO) Motor Reverse input on Rung 2 and the Examine If Open (XIO) Motor Forward input on Rung 3?"  <u>Answer: "To keep the motor from operating in the "Reverse" direction and to keep the motor from operating in the "Forward" direction, respectively"</u>	100%	0%	Yes
Learning Outcome 5:	(a) <u>Test 2, Question #23</u> <u>(M/C):</u> "Compressed air is stored for later use by a	100%	0%	Yes

<p><i>Demonstrate a knowledge of how compressors and pneumatic equipment operate and are maintained</i></p>	<p>pneumatic system using a(n):”  <u>Answer:</u> “Receiver”</p>			
<p>Learning Outcome 5:  <i>Demonstrate a knowledge of how compressors and pneumatic equipment operate and are maintained</i></p>	<p>(b) <u>Test 2, Question #25 (M/C):</u> “Advantages of using remotely controlled pressure relief valves include.”  <u>Answer:</u> “Efficiency” &amp; “Safety”</p>	<p>100%</p>	<p>0%</p>	<p>Yes</p>
<p>Learning Outcome 5:  <i>Demonstrate a knowledge of how compressors and pneumatic equipment operate and are maintained</i></p>	<p>(c) <u>Test 2, Question #29 (M/C):</u> “A solenoid-operated directional control valve uses:”  <u>Answer:</u> “Electricity to shift its spool”</p>	<p>100%</p>	<p>0%</p>	<p>Yes</p>

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

<p><b>Conclusions</b>  <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>Average of Performances for Each Assessed Learning Outcome:</p> <p>Learning Outcome 1: 100.00%                      Learning Outcome 2: 100.00%                      Learning Outcome 3: 100.00%                      Learning Outcome 4: 75.00%                      Learning Outcome 5: 100.00%</p> <p>The performance standard of 75% was met or exceeded on all five assessed Learning Outcomes.</p>

The performance standard of 75% was exceeded on eight of the nine indicators spread over the five Learning Outcomes assessed.

**Previous Assessment Reports and Results**

**Date of Previous Assessment:** N/A

**List of Outcomes Not Met:** N/A

**Summary of Actions Taken to Address Unmet Learning Outcomes:** Append additional pages if necessary. If appending, include notation in box to "See attached". N/A

N/A

**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".**

A more in depth explanation of, and lab training with, programmable logic controller ladder diagrams will be developed for the next iteration of the course with the goal of achieving 100% on the assessed indicator associated with this topic.

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

Approved as presented

Approved with recommendations for future reports (Explanation Required)

Resubmission Required. Reason for Resubmission:

**Date: 03/13/2019**