Eastern West Virginia Community and Technical College
COURSE ASSESSMENT REPORT

Course Title and Number: Supervisory Control & Data Acquisition WTT 230	**Academic Term and Year of Assessment Activity (Ex: Fall, 2014):** Spring, 2017
Report Submitted By: E. Putze	**Number of Students Assessed:** 1
Date Report Submitted: 4-18-2018	**Number of Sections Included:** 1
Course Delivery Format (list all modalities used in sections assessed. Ex: web based, VDL, traditional section, hybrid course, etc.): Web-based lab work and project; reading; review 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 provides hands-on experience working with industrial data communications hardware found in a commercial wind farm. Supervisory Control and Data Acquisition (SCADA) systems in the wind industry will be used to practice maintenance and operational tasks.

Assessment Methods

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

Lab Exercises & Project: Wonderware InduSoft Web Studio Educational software was used for lab exercises and project. SCADA HMI with inputs and interacting outputs were developed. The instructor was present throughout all labs; facilitated learning through demonstration and interaction with the student; and observed student performance.

Written Tests: Written tests, which were primarily multiple choice, were based mostly on material in *SCADA: Supervisory Control and Data Acquisition; author: Stuart A. Boyer; publisher: ISA – International Society of Automation; 2010*. Fill-in-the-blank reviews were utilized to enable learning. Selected questions from the eight tests given were used for assessment. Since results for Unit 8 Test questions are unavailable, the student's Unit 8 Test score was used to assess performance on Unit 8 Test questions by extrapolating the probability of the student answering correctly and incorrectly.

Final Exam: The final project was demonstrated and results were interpreted by the student and assessed by the instructor.

Assessment Results

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".

Course Outcome & Indicator	# of Students Answering Correctly	# of Students Answering Incorrectly	Composite
1(a)	1.0	0.0	1.0
1(b)	1.0	0.0	1.0
1(c)	1.0	0.0	1.0
+ 1(d)	0.92	0.08	1.0
2(a)	1.0	0.0	1.0
2(b)	1.0	0.0	1.0
2(c)	1.0	0.0	1.0
2(d)	1.0	0.0	1.0
3(a)	1.0	0.0	1.0
3(b)	1.0	0.0	1.0
3(c)	1.0	0.0	1.0
4(a)	1.0	0.0	1.0
4(b)	1.0	0.0	1.0
+ 4(c)	0.92	0.08	1.0
+ 4(d)	0.92	0.08	1.0
Total Answers	14.76	0.24	15
Percentage	98.4%	1.6%	100%

+ Since results for Unit 8 Test questions are unavailable, the student's Unit 8 Test score was used to assess performance on Unit 8 Test Questions by extrapolating the probability of the student answering correctly and incorrectly.

Course Level Assessment Summary of Outcomes, Indicators and Results **Add additional rows to table if necessary**				
Learning Outcomes (Insert learning outcomes assessed during this cycle)	**Indicator (Insert indicators used for each outcome: exam question, scoring rubric, etc. Be specific) +**	**Percent of Correct Responses**	**Percent of Incorrect Responses**	**Performance Standard Met (75%)* (yes or no)**
Learning Outcome 1: *Describe SCADA systems in industrial/wind businesses*	(a) <u>Units 3 & 4 Test, Question #8 (M/C):</u> "Which of the following is true?" <u>Answer:</u> "The MTU controls the communication process with the RTU"	100%	0%	Yes
Learning Outcome 1: *Describe SCADA systems in industrial/wind businesses:*	(b) <u>Unit 5 Test, Question #2 (M/C):</u> "Sensors and actuators communicate with an RTU using the same: A. Protocol B. Medium	100%	0%	Yes

	C. Twisted-pair of copper wires D. A & B Answer: "D"			
Learning Outcome 1: *Describe SCADA systems in industrial/wind businesses:*	(c) *Units 6 & 7 Test, Question #8 (M/C):* "Which of the following is more economical?" Answer: "Moving digital signals in a serial manner"	100%	0%	Yes
Learning Outcome 1: *Describe SCADA systems in industrial/wind businesses:*	(d) Unit 8 Test, Question #12 (M/C): "SCADA communication methods include: A. Satellite B. Cell phone C. Internet D. All of the above Answer: "D. All of the above"	92%	8%	Yes
Learning Outcome 2: *Describe SCADA functionality in systems*	(a) Units 6 & 7 Test, Question #2 (M/C): "At any point in time communication between an RTU and a field instrument is:" Answer: "One-way"	100%	0%	Yes
Learning Outcome 2: *Describe SCADA functionality in systems*	(b) Unit 9 Test, Question #4 (M/C): "For each item in the following list write: 'M' if it is a monitoring function of an RTU 'C' if it is a controlling function of an RTU 'T' if it is a totalizing function of an RTU actuating the yaw-drive motors"	100%	0%	Yes

	Answer: "C"			
Learning Outcome 2: *Describe SCADA functionality in systems*	(c) Unit 10 Test, Question #2 (M/C): "The 'report-by-exception' method of alarm monitoring informs the operator of:" Answer: "The status changes of alarms on a periodic basis"	100%	0%	Yes
Learning Outcome 2: *Describe SCADA functionality in systems*	(d) Unit 10 Test, Question #6 (M/C): "When an alarm is issued, the operator:" Answer: "Must acknowledge it to the MTU before visual and audible signals will cease"	100%	0%	Yes
Learning Outcome 3: *PLC control of SCADA systems in industrial environments*	(a) Units 3 & 4 Test, Question #6 (M/C): "Digital computers reduce the need for:" Answer: "Relays"	100%	0%	Yes
Learning Outcome 3: *PLC control of SCADA systems in industrial environments*	(b) Unit 5 Test, Question #1 (M/C): "Controllers are usually located in or near the:" Answer: "RTU"	100%	0%	Yes
Learning Outcome 3: *PLC control of SCADA systems in industrial environments*	(c) Unit 5 Test, Question #7 (M/C): "Which of the following is a mathematical representation of controller functionality?" Answer: "Algorithm"	100%	0%	Yes
Learning Outcome 4: *Understand communications systems utilized in industry*	(a) Units 1 & 2 Test, Question #1 (M/C): "Which of the following best describes SCADA?" Answer: "Distant facilities and limited control instructions"	100%	0%	Yes
Learning Outcome 4: *Understand communications systems utilized in industry*	(b) Units 3 & 4 Test, Question #5 (M/C): "A system that only gathers data and information is called:" Answer: "Telemetry"	100%	0%	Yes
Learning Outcome 4:	(c) Unit 8 Test, Question #2 (M/C):	92%	8%	Yes

Understand communications systems utilized in industry	"The seven functional layers of the Open Systems Interconnection (OSI) model define:" Answer: "Communication requirements between data terminals"			
Learning Outcome 4: *Understand communications systems utilized in industry*	(d) Unit 8 Test, Question #6 (M/C): "Modulation and demodulation is performed by the:" Answer: "Modem"	92%	8%	Yes
+ Since results for Unit 8 Test questions are unavailable, the student's Unit 8 Test score was used to assess performance on Unit 8 Test Questions by extrapolating the probability of the student answering correctly and incorrectly.				

* Please note if using a different minimum performance standard.

Conclusions **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".**
Using probabilities of the student answering assessed questions correctly and incorrectly when necessary and using actual test question results otherwise, the performance standard of 75% was exceeded by all fifteen questions spread over the four 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".**
Course outcomes will be expanded.

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: