

Student Learning Outcomes Assessment Summary

AAS, PROCESS TECHNOLOGY *Community and Technical College* **AY 2014/15-2015/16**

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1. Assessment information collected

Note: "Test Results" reflect aggregated data from several test questions selected during each semester, reflecting the individual SLOA topic. Percentages reported here represent the percentage of the class that have met the desired outcomes; the minimum target is 75%. Individual topic observations are included in the discussion session.

Note: "Skill Observations" reflect instructor observation of overall class performance on specific activities.

a. SLOA 1: Safety Awareness

- i. Test Results from PRT 110 – Introduction to Occupational Safety
 1. 2016 Final Exam - 96%.
- ii. Test Results from PRT 130 - Equipment
 1. 2015, 2016 Final Exams – 70% and 87%, respectively.
- iii. Test Results from PRT 230 – Systems
 1. 2014, 2015 Final Exams – 76% and 80%, respectively.
- iv. Skill Observation from PRT 231- Operations (capstone course)
 1. Five students were selected outside of normal classroom activities and asked to go to the upper deck and perform a task. The goal was to see if students donned proper PPE before entering into our safety designated area. All students complied with the request and had obtained and wore the proper gear. This was to see how engrained our safe work practices in our students.

b. SLOA 2: Operating Procedures

- i. Skill Observation from PRT 231 – Operations (capstone course)
 1. Student Procedures for operating the CTC Process Unit. Students drew a P& ID for the process unit and then wrote procedure for both Unit Start-up and Shutdown. These procedures met or exceeded industry goals for accuracy,

clarity, proper sequence, required authorizations, and completeness. All procedures were successfully executed and reviewed by classmates. Corrections were made and final drafts were submitted for review by instructor. All activities were initiated with a Safety Huddle to review any outstanding concerns or risks.

2. Students operated the process unit and managed a real-time scenario where a pump was disabled. Students successfully solved the problem and kept the process running without creating an upset situation.
- ii. Skill Observation from PRT 250 – Troubleshooting (capstone course)
 1. All students demonstrated the ability to start up and shut down a process (using the computer-based process simulator.)
 2. 100% of students in the surveyed class demonstrated the ability to correct abnormal operation conditions (utilizing the computer based process simulator.)

c. SLOA 3: Records of Process Events

- i. Test Results and Skill Observations from PRT 250 - Troubleshooting
 1. Test results from the surveyed class: 100%.
 2. All students in the surveyed class demonstrated the ability to interpret event records to determine proper process changes (using the computer-based process simulator).
- ii. Test Results from PRT 255 - Quality
 1. 2014, 2015 Final Exams – 94% and 89%, respectively.

d. SLOA 4: Read and Interpret Piping & Instrumentation Drawings (P&ID's)

- i. Completion scores on PRT 101 P&ID training book (85% or better)
 1. 2014, 2015 Final Exams: 100% and 89%, respectively.
- ii. Test Results from PRT 140
 1. 2015, 2016 Final Exams: 81% and 87%, respectively.
- iii. Test Results from PRT 144
 1. 2014, 2015 Final Exams for the surveyed sections: 76% and 74%, respectively.
- iv. Test Results from PRT 230:
 1. 2014, 2015 Final Exams: 73% and 71%, respectively.
- v. Skills Observations from PRT 250 –
 1. All students in the surveyed class demonstrated the ability to interpret process information from P&ID drawings.

e. SLOA 5: Equipment Knowledge

- i. Test Results from PRT 130:
 - 1. 2015, 2015 Final Exams: 84% and 86%, respectively
- ii. Test Results from PRT 140 –
 - 1. 2015, 2016 Final Exams: 70% and 77%, respectively.
- iii. Test Results from PRT 144 –
 - 1. 2014, 2015 Final Exams for the surveyed sections: 75% and 83%, respectively.
- iv. Test Results from PRT 230 –
 - 1. 2014, 2015 Final Exams: 85% and 81%, respectively.

2. Conclusions drawn from the information summarized above

a. SLOA 1: Safety Awareness

- i. Test results show that student learning outcomes were met in safety awareness areas. Material is adequately covered. More emphasis on safety topics in class PRT 130 resulted in higher success rates in 2016. We note that the skills evaluation was a valuable snapshot into student attitudes towards safety equipment on the job.

b. SLOA 2: Operating Procedures

- i. Students have successfully demonstrated the required skills. Material is adequately covered. We note that instructors may use different approaches to this material; some discussion about the relative benefits of consistent approach may be valuable.

c. SLOA 3: Records of Process Events

- i. Students demonstrated the ability to maintain accurate and meaningful process records. Students demonstrated the ability to use quality tracking tools to analyze data.

d. SLOA 4: Read and Interpret Piping & Instrumentation Drawings (P&ID's)

- i. Students demonstrated the ability to read and interpret P&ID's. This material builds from semester-to-semester, and culminates in Operations (PRT 231) and Troubleshooting (PRT 250) class projects. Students are demonstrating excellent skills with P&ID's. We have increased focus on P&ID skills over the last several years, in all our classes.
- ii. Note that PRT 230, the Systems class, test results are a bit below the desired outcome. P&ID work in PRT 230 includes complex discussion of process conditions based on P&ID review – some more review is indicated.

e. SLOA 5: Equipment Knowledge

- i. Students demonstrated knowledge on the fundamentals of a wide variety of process equipment. In addition, they demonstrated knowledge of the mechanical details on process instrumentation,

and the fundamentals of major processing systems. Material is being adequately covered. Note that mechanical knowledge of instrumentation in the introductory course, PRT 140, is below our targeted success rate.

3. Curricular changes resulting from conclusions drawn above

a. SLOA 1: Safety Awareness:

- i. Continued emphasis on safe operating requirements is always valuable.

b. SLOA 2: Operating Procedures

- i. Continue work to provide more consistency between sections of the class.

c. SLOA 3: Records of Process Events

- i. We have discussed adding some skills observations exercises into the Instrumentation classes, PRT 140 and PRT 144 – these could demonstrate student skills in recording and responding to process operating data.

d. SLOA 4: P&ID Skills

- i. No changes recommended; however, we will continue to review class activities and focus on P&ID fundamentals. In particular, PRT 230 offers good opportunities for discussing process operations based on P&ID review.

e. SLOA 5: Equipment Knowledge:

- i. Continue to develop more hands-on activities in the introductory courses, PRT 130 and PRT 140. In particular, increase focus on the mechanical/installation aspects of process instrumentation.

4. Identify the faculty members involved in reaching the conclusions drawn above and agreeing upon the curricular changes resulting

- a. Brian Ellingson, Associate Professor, Program Coordinator
- b. Robert Hook, Assistant Professor
- c. Teresa Lantz, Assistant Professor