

Student Learning Outcomes Assessment Summary

Process Technology, AAS *UAF Community and Technical College* AY 16/17 and 17/18

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1) Assessment information collected

Note: "Test Results" reflect aggregated data from several test questions, usually from the Final Exam, that reflect 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 individual or overall class performance on specific activities.

a) SLOA 1: Safety Awareness

- i) Test Results from PRT 110 – Introduction to Occupational Safety
 - (1) 2017 Final Exam, section T01 – 87.5%
 - (2) 2017/18 Final Exam, section TE1/TXA – 93.7%
- ii) Test Results from PRT 130 - Equipment
 - (1) 2018 Final Exam – 77.7%
- iii) Test Results from PRT 230 – Systems
 - (1) 2017 Final Exam – 86.7%
- iv) In-Class Skill Evaluation from PRT 110, Sections TE1/TXA – average of 98% correct
 - (1) Note: Skills were practiced multiple times to enable students to 'master' the skills.
- v) Skill Observation from PRT 140 – Instrumentation
 - (1) 2018 – Students were observed while operating an instrument training unit using a written procedure. 77.8% of students donned the indicated PPE without any prompting from the Instructor.
- vi) Skill Observation from PRT 231- Operations (capstone course)
 - (1) 2018: Three 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) PRT 101: All students and all sections were required to put on PPE, climb a ladder onto second story expanded grate. This was recommended by NAPTA as a method to determine if students were physically and mentally prepared for activities required of a Process Technician. All students passed in both years.
- ii) PRT 140: Spring 2018. Students were observed while operating an instrument training unit using a written procedure. Eleven specific criteria were observed. Students successfully executed 81.8% of the procedure criteria (i.e. without prompting).
- iii) PRT 230: Students Procedure for CTC Process Unit. Students in 2017 drew a P&ID for the CTC Water Circulation Process. In both 2017 and 2018 students wrote procedures 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 reviewed by classmates and utilized for the safe start-up and shutdown of the process. Corrections were made and final draft were submitted for review by instructor. All activities were initiated with a Safety Huddle to review any outstanding concerns or risks.

c) SLOA 3: Records of Process Events

- i) Test Results and Skill Observations from PRT 250 – Troubleshooting:
 - (1) 2018 Final Exam re: Interpreting Event Records:
 - (a) Test results: 92%
 - (b) Skill evaluation, using full-scale, industry standard, operating process: 98%
 - (2) Maintain accurate records:
 - (a) In-class Logbook entry exercise: 90%
 - (b) Computer Simulation Exercises: 95%
 - (3) 2018 Final Exam re: Troubleshooting Tools
 - (a) Test Results: 98%

- ii) Test Results and Skill Observations from PRT 255: Quality. Ability to interpret process data – specifically, graphing and analysis of data.
 - (1) 2017 Final Exam Test Results: 89.5%
 - (2) 2017 Skill Evaluation (Excel graphing exercise): Average score was 88.6%, for students who submitted this portion of the final exam.

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

- i) PRT 101 - P&ID Workbook completion data: Composite data from 3 class sections in 2016 and 2017 showed 83% of students scored at least 85% on this portion of the course.
- ii) Test Results from PRT 140 – Final Exam 2017: 83.3%
- iii) Test Results from PRT 144 – Final Exam 2017: 85.9%
- iv) Test Results from PRT 230 – Final Exam 2017: 61.5%
 - (1) Most questions missed were higher-level drawing interpretation questions.

e) SLOA 5: Equipment Knowledge

- i) Test Results from PRT 130 – General Equipment
 - (1) Final Exam 2018: 88.5%
- ii) Test Results from PRT 140 – Instrumentation I
 - (1) Final Exam 2017: 69.4%
 - (2) Final Exam 2018: 86.8%
 - (a) Note: PRT 140 transitioned to hybrid delivery in 2018. Final exam is in Blackboard, which required changing format of questions. Similar topics covered.
- iii) Test Results from PRT 144 – Instrumentation II
 - (1) Final Exam 2017: 82.1%
- iv) Test Results from PRT 230 – Systems
 - (1) Final Exam 2017: 88.3%

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. We performed safety awareness skills evaluations in both an introductory course, and a capstone course. These evaluations give valuable insight into student attitudes and knowledge about safety equipment on the job.

b) SLOA 2: Operating Procedures

- i) Students have successfully demonstrated the required skills. Material is adequately covered.

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.

(1) Note: More Excel graphing exercises were incorporated into PRT 255 this year. Students demonstrated good skills with data graphing.

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) PRT 230 test results are below the desired outcome. P&ID work in PRT 230 includes complex discussion of process conditions based on P&ID review – it hasn't translated well to questions on the final exams. This is only a portion of the P&ID work done in PRT 230. It may be valuable to evaluate some of the other P&ID work done in that class, such as drawing P&ID's.

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.
- ii) PRT 140: Mechanical knowledge of instrumentation in the introductory course, PRT 140, was below our targeted success rate in 2017.
- iii) In 2018, PRT 140 changed to a hybrid delivery method. All class material/lecture were delivered on-line. Regular lab sessions were scheduled, where the primary focus was hands-on lab work. This arrangement provided nearly twice as many lab hours as the traditional lecture/lab combination class. In addition, the on-line lecture material included many annotated photos and discussion of instruments.
- iv) Student response, and test results, indicate that the hybrid delivery method has been effective in this area.

3) Curricular changes resulting from conclusions drawn above

a) SLOA 1: Safety Awareness:

- i) Continued emphasis on safe operating requirements is always valuable.
- ii) Expand and enhance safety skills evaluation for each pertinent course in the Process Technology major courses to track student development.

b) SLOA 2: Operating Procedures

- i) Continue adding skills evaluation into the Instrumentation classes, focusing on safe operating procedures.

c) SLOA 3: Records of Process Events

- i) PRT 250:
 - (1) Continue multiple troubleshooting exercises (both computer-based and live process) to allow students to “master” troubleshooting skills.
 - (2) Establish skill expectations earlier in the course, give students updates on their progress in meeting expectations.
 - (3) Increase role-playing scenarios allowing students to each take leadership positions in troubleshooting.

d) SLOA 4: P&ID Skills

- i) 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.
- ii) PRT 230: Review expectations for students around P&ID skills in this class.
- iii) PRT 230: Evaluate the effectiveness of P&ID drawing exercises/labs.

e) SLOA 5: Equipment Knowledge:

- i) Continue to develop more hands-on activities in the introductory courses.

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

5) Has your SLOA plan been updated to include assessment of the program's Communication Plan, as required by Faculty Senate motion?

- a) N/A for AAS or Certificate programs