

**Course Assessment Report  
Washtenaw Community College**

Discipline	Course Number	Title
Fluid Power	226	FLP 226 02/20/2017- Pneumatics
Division	Department	Faculty Preparer
Advanced Technologies and Public Service Careers	Industrial Technology	Jim Popovich
Date of Last Filed Assessment Report		

**I. Assessment Results per Student Learning Outcome**

Outcome 1: Perform calculations using basic Gas Laws.

- Assessment Plan
  - Assessment Tool: Math section of final exam
  - Assessment Date: Fall 2011
  - Course section(s)/other population: All sections
  - Number students to be assessed: All students
  - How the assessment will be scored: Answer key
  - Standard of success to be used for this assessment: 80% of students must score 80% or higher.
  - Who will score and analyze the data: Full time faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
		2015, 2014

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
23	23

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

All 23 were assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

Class is held once a year. All students in both classes were assessed.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Department-written final exam was used and scored by the instructors. Questions 12-18 and 23-25 specifically refer to the Pneumatics gas laws.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes

20 out of 23 students (87%) of the students achieved this outcome of solving problems using the gas laws.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

The students met the standard of success in solving problems for pneumatic circuits that involved the application of gas laws in isothermal, isobaric and isochoric conditions.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

There is room for improvement in the application of the gas laws in pneumatic applications. Utilizing more examples in reinforcing concept and worksheets providing more examples of where the gas laws come into play may help.

Outcome 2: Using schematic diagrams and department equipment, build functioning intermediate level circuits.

- Assessment Plan
  - Assessment Tool: Hands-on portion of final exam
  - Assessment Date: Fall 2011

- Course section(s)/other population: All sections
- Number students to be assessed: All students
- How the assessment will be scored: Departmental rubric
- Standard of success to be used for this assessment: 80% of the students will score 80% or higher.
- Who will score and analyze the data: Department faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
		2013, 2012

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
25	23

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

All who completed the final exam were assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

Class is conducted once a year in S/S semester if population warrants.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Students were issued a Moving Part Logic cylinder sequencing circuit and instructed to build the circuit. Was pass/fail.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes  
 All students (100%) were successful in constructing the pneumatic circuit from a circuit diagram.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

All students were able to build an intermediate-level pneumatic circuit on the Pneumatic Trainers from a circuit diagram.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Since all students were successful in constructing the circuit, the focus on hands-on student exercises where they construct circuits on the pneumatic trainer will continue.

Outcome 3: Design basic sequencing circuits using ANSI, ISO and Numatrol schematic symbols.

- Assessment Plan
  - Assessment Tool: Circuit design quiz
  - Assessment Date: Fall 2011
  - Course section(s)/other population: All sections
  - Number students to be assessed: All students
  - How the assessment will be scored: Answer key
  - Standard of success to be used for this assessment: 80% of students will score 80% or better.
  - Who will score and analyze the data: Department faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
		2014, 2012

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
27	23

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

All students present on the final week were assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

FLP 225 class is conducted once a year in S/S semester.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Students were issued a Design Quiz and quiz was scored by the instructor.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes

20 out of 23 (87%) were able to design the sequencing circuit.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Majority of students were able to design a circuit from a written description and built it on the pneumatic trainer.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Even though the standard of success was met, I am considering replacing this outcome with preparation for International Fluid Power Society certification in Pneumatics.

#### Outcome 4: Interpret component and circuit level actions and functions.

- Assessment Plan
  - Assessment Tool: Final Exam

- Assessment Date: Fall 2011
- Course section(s)/other population: All sections
- Number students to be assessed: All students
- How the assessment will be scored: Department answer key
- Standard of success to be used for this assessment: 80% of the students will score 80% or higher.
- Who will score and analyze the data: Department faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
		2014

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
15	11

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

All students completing the final exam were assessed.
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4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

Students from S/S 2014 were assessed due to the addition of the Uniloy real-world pneumatic circuit diagram added to final exam.
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5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Questions 77-80, 83-85 and 86-90 (total of 12 questions) of the written final exam were scored by the instructor.
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6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: <u>Yes</u>
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100% of the students scored 80% or better on this metric.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

The students were able to read circuit diagrams of pneumatic systems not previously discussed and identify actions and functions of components within the circuits.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Plan to continue to use circuit diagrams from manufacturers, as they are available to reinforce the skill of interpreting circuit diagrams.

Outcome 5: Recall relationships between force, pressure, area, volume, compression, humidity, and temperature.

- Assessment Plan
  - Assessment Tool: Final Exam
  - Assessment Date: Fall 2011
  - Course section(s)/other population: All sections
  - Number students to be assessed: All students
  - How the assessment will be scored: Department answer key
  - Standard of success to be used for this assessment: 80% of students will score 80% or better.
  - Who will score and analyze the data: Department faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
		2014, 2012

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
27	23

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

All students who completed the written final exam were assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All students were included who completed the final exam.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Questions related to the assessed outcome were scored and tabulated by the instructor (12-15, 17, 21-22, 23-25, 28-30, 81).

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes

20 of the 23 students (87%) assessed scored at least 80% on this question set. The standard of success was met.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Majority of students were able to identify common relationships affecting pneumatic systems that are not present in hydraulic systems due to the compressibility of air and its provenance.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Success rate may be improved through the use of more examples in homework assignments and in-class exercises.

## II. Course Summary and Action Plans Based on Assessment Results



1. Describe your overall impression of how this course is meeting the needs of students. Did the assessment process bring to light anything about student achievement of learning outcomes that surprised you?

No surprises, yet.

2. Describe when and how this information, including the action plan, was or will be shared with Departmental Faculty.

Will be shared with S/S 2017 Pneumatics instructor.

3. Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
No changes intended.			

4. Is there anything that you would like to mention that was not already captured?

Would like to review MPL portion of pneumatics class and integrate Pneumatic Specialist certification from International Fluid Power Society preparation into the course.

### III. Attached Files

[Final Exam](#)  
[Hands ON Final](#)

**Faculty/Preparer:** Jim Popovich **Date:** 02/22/2017  
**Department Chair:** Thomas Penird **Date:** 02/25/2017  
**Dean:** Brandon Tucker **Date:** 03/01/2017  
**Assessment Committee Chair:** Ruth Walsh **Date:** 03/29/2017