

Course Assessment Report
Washtenaw Community College

Discipline	Course Number	Title
Electricity/Electronics	111	ELE 111 02/20/2017- Electrical Fundamentals
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: Identify the physical and electrical properties of resistive, inductive, and capacitive devices and analyze their behavior in DC and AC circuits.

- Assessment Plan
 - Assessment Tool: Departmental test questions (multiple choice/matching) included as part of instructor developed tests.
 - Assessment Date: Winter
 - Course section(s)/other population: all
 - Number students to be assessed: all
 - How the assessment will be scored:
 - Standard of success to be used for this assessment:
 - Who will score and analyze the data:

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)
2016	2015	

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

# of students enrolled	# of students assessed
62	57

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.

Withdrawal from classes resulted in less than full initial enrolled students being 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 from Fall 2016 and Winter 2015 were assessed.

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

Written Final Exam was scored. For purpose of assessment - questions 14-29 and 45-49 were used.

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

The students scored an average of 82%, indicating 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.

The students were able to identify resistors, inductors and capacitors within circuits and understand on a basic level the function of inductors and capacitors in DC and AC 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.

Will add animation and video clips from didactic websites to augment course materials.

Outcome 2: Read and interpret wiring diagrams for the purpose of wiring circuits, determining the normal operation of circuits, and for troubleshooting circuit faults.

- Assessment Plan
 - Assessment Tool: Successful completion of panel wiring and troubleshooting lab.
 - Assessment Date: Winter
 - Course section(s)/other population: all
 - Number students to be assessed: all
 - How the assessment will be scored:
 - Standard of success to be used for this assessment:
 - Who will score and analyze the data:

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)
2016, 2015	2016, 2015	

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

# of students enrolled	# of students assessed
99	84

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.

Those who dropped the class within the first 5 weeks did not participate in the panel wiring exercise.

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 classes in those semesters were assessed.

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

Lab 6 is the lab that involves Panel Wiring. Although some students required additional time on Saturdays to complete their panel wiring, all were eventually able to follow the electrical circuit diagram to wire the panels correctly.

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>
All students who completed the ELE 111 classes were successful in wiring the panel.

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

Students without an electrical background were successfully able to wire an industrial panel including lights, switches and 2 relays.

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.

Including a stand-alone relay lab prior to the relay panel wiring (Lab 6) should help with the transition from breadboard circuit building to wiring the panel.

Outcome 3: Identify the concepts and principles used to describe the operation of magnetic and electromagnetic devices.1

- Assessment Plan
 - Assessment Tool: Departmental test questions (multiple choice/matching).
 - Assessment Date: Winter
 - Course section(s)/other population: all
 - Number students to be assessed: all
 - How the assessment will be scored:
 - Standard of success to be used for this assessment:
 - Who will score and analyze the data:

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)
2016	2016, 2015	

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

# of students enrolled	# of students assessed
80	69

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.

Students who withdrew before the 7th week were not present to complete the assessment.

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 who took the midterm exam in the selected semesters were included.

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

Questions 40-47 on the midterm written exam were scored by the course instructors and tabulated.

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

Those assessed scored an aggregate of 87% on these questions, indicating they met the standard of success.

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

Students were able to identify effect of inductors and capacitors and electro-magnetic fields in 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.

Adding links to didactic multimedia may help improve grasp of subject matter.

Outcome 4: Demonstrate the proper use of electrical test equipment, including the multimeter, watt meter, and oscilloscope.

- Assessment Plan
 - Assessment Tool: Departmental lab exams.
 - Assessment Date: Winter
 - Course section(s)/other population: all
 - Number students to be assessed: all
 - How the assessment will be scored:
 - Standard of success to be used for this assessment:
 - Who will score and analyze the data:

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)
2016	2016, 2015	

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

# of students enrolled	# of students assessed
80	67

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.

The students who withdrew or dropped from the ELE 111 class were not present to perform the lab exams.

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 from Fall 2015, Winter and Fall 2016 who completed the midterm and final hands-on tests were assessed.

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

The students were issued a circuit diagram, test equipment and components required to build circuits and perform measurements.

Midterm lab exam involved 3-component series-parallel resistor circuit and measurement of resistance, voltage and current.

Final lab exam involved a series RLC circuit, function generator and dual channel oscilloscope to measure phase angle.

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 were able to successfully complete the lab exams and perform appropriate measurements.

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

Students were able to build a 3-component resistor circuit and use a multimeter to measure resistance, current and voltage within that circuit.

They were also, for the most part, able to use the oscilloscope and oscillator to perform measurements on a series RLC circuit.

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.

Not sure how to improve on a 100% percent success rate (students are informed that they will NOT pass the class if these hands-on tests are not completed successfully).

Outcome 5: Analyze DC series, parallel, and series-parallel circuits and determine selected voltage, current, resistance, and power values.

- Assessment Plan
 - Assessment Tool: Departmental test questions (multiple choice/matching).
 - Assessment Date: Winter
 - Course section(s)/other population: all
 - Number students to be assessed: all
 - How the assessment will be scored:

- Standard of success to be used for this assessment:
- Who will score and analyze the data:

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)
2016	2016, 2015	

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

# of students enrolled	# of students assessed
80	73

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.

Students who withdrew or dropped the ELE 111 classes were not present to complete the midterm written exam.

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 from the identified semesters were assessed who completed the written portion of the midterm exam.

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

The written portion of the midterm exam that covers DC circuits was scored by the ELE 111 instructors.

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
 The students scored 84% on the selected portion of the midterm exam, indicating a grasp of series, parallel and series-parallel resistive circuits.

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

With some exceptions, students were able to complete troubleshooting breadboard portions of the lab exercises.

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.

Due to a late-starting ELE 111 class in Winter 2017, I have a class with only 12 students who all work independently (no sharing of lab equipment). It will be interesting to see if success rate improves.

Outcome 6: Analyze AC series and parallel circuits and determine selected voltage, current, impedance, and power values and the phase angle and power factor of the circuit.

- Assessment Plan
 - Assessment Tool: Departmental test questions (multiple choice/matching).
 - Assessment Date: Winter
 - Course section(s)/other population: all
 - Number students to be assessed: all
 - How the assessment will be scored:
 - Standard of success to be used for this assessment:
 - Who will score and analyze the data:

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)
2016	2016, 2015	

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

# of students enrolled	# of students assessed
80	69

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.

Students who dropped or withdrew from the class were not available to complete the written final exam.

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 from the identified semesters were assessed.

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

Questions from the written portion of the final exam were scored by the instructors.

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

The assessed students had an aggregate score of 81%, so 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.

Students were better able to analyze series RLC circuits than parallel RLC 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.

Will be adding more worksheets and links to multimedia didactic sites to improve student grasp of RLC circuits

Outcome 7: Troubleshoot faults (opens and shorts) in series, parallel, and series-parallel circuits.

- Assessment Plan
 - Assessment Tool: Successful completion of troubleshooting labs.
 - Assessment Date: Winter
 - Course section(s)/other population: all
 - Number students to be assessed: all

- How the assessment will be scored:
- Standard of success to be used for this assessment:
- Who will score and analyze the data:

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)
2016, 2015	2016	

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

# of students enrolled	# of students assessed
74	67

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.

Students who withdrew from or dropped the class were not 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.

All ELE 111 classes from Fall 2015, Winter 2016 and Fall 2016 were selected.
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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.

The lab exercises for Series, Parallel and Series-Parallel circuits included: troubleshooting boards that contained shorts, opens or not faults for the students to identify using a multimeter. Students were often paired in the conduct of the lab exercises.
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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>
The sign-off of the lab exercises indicates that 100% of the assessed were able to identify faults on troubleshooting breadboard.

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

Students were successfully able to identify what voltages and resistances should be within breadboarded circuits and using multimeters identify faults.

- 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.

Series-Parallel circuits were tougher for students to grasp. Will be adding to the course-pac worksheets hopefully to assist in this area.

II. Course Summary and Action Plans Based on Assessment Results

- 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?

Students are taking the ELE 111 class either as a pre-requisite for more advanced ELE classes, or to improve their prospects of getting into electrical apprentice jobs. There is always room for improvement.

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

Will be sharing this information with Dale Petty and the other ELE 111 faculty member in the S/S 2017.

- Intended Change(s)

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

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

Although functional, some of our lab equipment is WWII surplus and should be updated.

III. Attached Files

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:** 03/19/2017