

Course Assessment Report  
Washtenaw Community College

Discipline	Course Number	Title
Electricity/Electronics	111	ELE 111 12/24/2019- Electrical Fundamentals
College	Division	Department
Advanced Technologies and Public Service Careers	Advanced Technologies and Public Service Careers	Advanced Manufacturing
Faculty Preparer		Jim Popovich
Date of Last Filed Assessment Report		

**I. Review previous assessment reports submitted for this course and provide the following information.**

1. Was this course previously assessed and if so, when?

Yes
Unknown - Done by Gary Downen

2. Briefly describe the results of previous assessment report(s).

Unknown -
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3. Briefly describe the Action Plan/Intended Changes from the previous report(s), when and how changes were implemented.

Unknown
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**II. 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)
2018	2019, 2018	

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

# of students enrolled	# of students assessed
94	58

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 sections for which we had copies of the Final Exam were assessed, including sections from Winter and Fall 2018 and Winter 2019.

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.

As there are no DL, MM, or extension center ELE 111 classes due to the lab equipment requirements, only on-campus evening and afternoon sessions were assessed.

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

Final exam questions corresponding to each outcome were selected and student/by questions answers were tabulated in Excel. The number of individual students who achieved the standard of success was 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  
 44 of 58 (76%) students scored 70% or better for this outcome.

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

The majority of students were able to meet the standard of success in identifying the components commonly used in DC and AC circuits and identifying the function of each within a circuit.

- 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.

Student understanding of subject matter could/should be improved if they were exposed to follow-up discussion of subject matter covered in lab. Questions are asked at the end of each lab exercise, but additional discussion a few days later would be helpful.

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:

- 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)
2018	2019, 2018	

- Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
94	56

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.

One ELE 111 class from each of the three semesters was selected for assessment & only those completing the assessment tool (final exam) were assessed. We had a faculty member retire due to Covid - did not have access to the final exams to be able to score.

This report was started on December of 2020. Did not have data for later semesters. Will include the later semesters in future course assessment work.

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.

The students completed labs 6 and 7 which involved panel wiring from schematic diagrams which involved terminal block and relay socket wiring.

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

Students work in pairs assembling a 2-relay and 5-button panel on a lab table.

Proper circuit function was evaluated by instructional staff and signed off. Upon wiring completion, at least three troubleshooting faults were inserted with students out of the room. Students then restored functionality to the circuit.

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 successful in wiring the panels - many completing the work within the 5 class hours allotted, with some working on completing the panels on open-lab days and Saturdays.

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

100% of the panel wiring lab projects were completed and functional. This involves interpreting circuit diagrams in order to accomplish point-to-point wiring. The troubleshooting also involved the use of the circuit diagram in order to identify potential cause of failure.

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.

Actual measurement of individual student performance could be accomplished if the panel wiring was done individually. This would require potentially doubling the college investment in wiring panels and power supplies.

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

- 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)
2018	2019, 2018	

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

# of students enrolled	# of students assessed
94	58

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 assessment included all students in three sections for which we had the Final 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.

The ELE classes have no distance learning, mixed mode or extension center classes due to the lab equipment requirement to conduct the hands-on lab exercises. Evening and afternoon on-campus classes were assessed.

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

Final exam questions corresponding to each outcome were identified and individual student "scoring" per question was recorded in Excel. The final exam for ELE 111 was scored by ELE fulltime faculty member.

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

50 of 58 (86%) students in the 3 classes scored 70% or higher on Outcome #3.

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

50/58 (85%) of the students were able to identify the function of transformers in AC circuits in order to increase/decrease voltage and the consequent decrease/increase in electrical current. The standard of success was met.

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.

As the standard of success was met, questions regarding relays will be moved to the Final Exam for the purpose of simplifying the assessment tool.

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)
2018	2018, 2019	

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

# of students enrolled	# of students assessed
94	58

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.

One ELE 111 class from each semester was selected for assessment. Only students who completed the Final Exam were assessed - as the Departmental Lab exams are issued at the Midterm and Final 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.

The ELE 111 course completers in Fall 2018, Winter 2019 and Fall 2019 were assessed via hands-on lab exams. The midterms consisted of a series-parallel three component resistive DC circuit and the final lab exam consisted of a series RLC circuit.

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

The midterm and final lab exams were issued in a separate room with equipment and components set out for the circuits to be constructed using lab equipment to perform measurements. As the students completed each step of the lab exams, successful completion was initialed by the lab 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: <u>Yes</u>
The Lab exams were returned indicating whether each student:  Built the circuit correctly on a breadboard using the test equipment.  Performed correct measurements using multimeter or oscilloscope.  52 out of 58 (90%) of students were successful in setting up and using the lab equipment to perform measurements.

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

50/57 (88%) of the students performed well in the hands-on use of electrical test equipment in hands-on midterm and final exams.
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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.

The achievement of this learning outcome could be improved with allowing re-takes of hands-on tests should any individual student not score 100% on the midterm and final exam hands on tests.
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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)
2018	2019, 2018	

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

# of students enrolled	# of students assessed
94	58

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 Final Exam in the Winter 2018, Fall 2018 and Winter 2019 in the three sections selected 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.

WCC has no ELE distance learning, mixed mode or extension site classes due to the hands-on equipment requirements. Classes for which we saved the written final exam were assessed.

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

The Final Exam was scored by a full-time faculty member and tabulated in Excel on a student by question basis corresponding with each learning outcome.

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: No  
 46/58 (79%) of the students scored 70% or better on the questions corresponding with this outcome.

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

46 of 57 (81%) of the assessed students were able to analyze beginner-level series, parallel and series-parallel 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.

Issuing improved, focused worksheets for student analysis in class and/or homework may improve student learning.

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)
2018	2019, 2018	

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

# of students enrolled	# of students assessed
94	58

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 Final Exam - Both Written and Hands-On portions 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.

Day and evening session students were included in the assessment.

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

The outcomes were matched with questions on the department final exam.

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 questions on the final exam were tabulated. The standard of success was met, with 71 percent (41 of 58) of students able to answer questions related to AC series and parallel circuits including resistors, capacitors and inductors.

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

37/57 (65%) The students were NOT able, for the most part, to analyze the unique characteristics of AC series and parallel circuits that were resistive.

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.

Focusing on AC RL, RC or RLC circuits with worksheets and/or in-class problems may help with the goal of continuous improvement.

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)
2018	2019	

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

# of students enrolled	# of students assessed
66	58

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 completed the departmental Hands-On Midterm Exam, but some required a second attempt to perform the measurements properly.

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.

The students were in evening and afternoon sections of the Winter 2018 & Winter 2019 and Fall 2018 classes.

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

The tool was a written midterm exam which involved the students using a power supply, connecting wires, breadboard and three resistors.

The students measured and recorded the resistor values using an ohmmeter.

The circuits were constructed on the breadboard and verified by the instructor.

The students measured and recorded each component's current flow using an ammeter.

The students measured and recorded each component's voltage using a voltmeter.

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 achieving this desired outcome, with a number of them requiring a second attempt, which was scheduled within 5 days of the first.

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

As lab pairs, 45/57 (79%) of the students were able to identify open circuits, short circuits in breadboard circuits using a multimeter in DC 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.

Students achieved the standard of success when paired in the lab stations. Having students do troubleshooting individually would double the lab time required. To facilitate assessment in future classes, questions will be added to the written final exam.

### III. Course Summary and Intended Changes Based on Assessment Results

1. Based on the previous report's Intended Change(s) identified in Section I above, please discuss how effective the changes were in improving student learning.

2.

3. 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?

The ELE 111 is an introductory class used to introduce students to electrical theory and practice, with most students pursuing mechatronics/automation related disciplines.

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

This report will be shared with full-time ELE 111 faculty in Fall 2022 semester when/if a full-time faculty member is hired. The department has been utilizing part-time faculty since the full-time faculty member's retirement.

5. Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
Assessment Tool	We are considering moving questions regarding relays to the final exam. They have already been moved to the mid-term which takes place just after coverage of relays.	Reinforce student learning by including the concepts on the next test.	2022
Course Materials (e.g. textbooks, handouts, on-line ancillaries)	Create focused worksheets on AC, RL, RC or RLC circuits for the class.	Provide students with additional practice related to these concepts.	2022

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

The Final Exam will be re-written for use in Fall 2021 semester in order to better serve as an assessment tool, including questions/outcomes that were in the Midterm.

### III. Attached Files

[ELE 111 Fall 2018](#)  
[ELE 111 Winter 2018](#)  
[ELE 111 Winter 2019](#)

**Faculty/Preparer:** Jim Popovich **Date:** 08/14/2021  
**Department Chair:** Thomas Penird **Date:** 08/16/2021  
**Dean:** Jimmie Baber **Date:** 08/19/2021  
**Assessment Committee Chair:** Shawn Deron **Date:** 11/30/2021

**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.
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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.
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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.

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.

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.

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 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