



Electronics Engineering Technology (EET) Annual Report for Assessment of Outcomes 2012-2013

Subject Area Committee Name: Electronics Engineering Technology (EET)

Contact Person: Sanda Williams, SAC Chair

Note: EET Degree Outcome Assessment Plan included as attachment

Outcome 1 - Predict and characterize analog circuit behavior by applying analog circuit analysis techniques

- 1. Describe changes that have been implemented towards improving students' attainment of outcomes that resulted from outcome assessments carried out the previous academic year.**

A chapter's worth of material was identified as less relevant to the rest of the curriculum and thus removed from the analog circuits courses. This allowed more lecture time to use in learning the remaining material.

The inclusion of qualitative questions on the EET112 exam was not done this year.

- 2. Identify the outcomes assessed this year and describe the methods used. What were the results of the assessment (i.e., what did you learn about how well students are meeting the outcomes)?**

This outcome was assessed using the final exams for EET112 (see attachment: **EET112-2013-Winter-Final_Exam.pdf**). Coordination between multiple section instructors yielded exams that tested multiple sections of EET112 students on the same circuit analysis techniques. The exams were graded in a way such that points were awarded the same way across multiple sections for individual circuit analysis techniques.

- 3. Provide information about the results (i.e. what did you learn about how well students are meeting the outcomes)?**

Overall, 100% of the students completing the EET112 exam from the fall track (40 students) were evaluated. None of the students from the winter track were assessed (approximately 25 students).

Of the students that were assessed, a minimum score of 70% is considered passing with a grade of C. Twenty eight out of 40 students scored a C or better. Twenty three out of the 40 students scored an A or a B. The average score was 79.7%.

Based on these results, the EET department is shown to have accomplished this outcome during the past academic year.

- 4. Identify any changes that should, as a result of this assessment, be implemented to help improve students' attainment of outcomes. (These may include, but are not limited to, changes in curriculum, content, materials, instruction, pedagogy etc).**

Based on the assessment results, the two lowest-scoring categories were identified: Thevenin's theorem and the maximum power transfer theorem.

A larger part of lecture time will be spent on deepening the understanding of these two topics.

- 5. Reflect on the effectiveness of this assessment tool and assessment process. Please describe any changes to assessment methodology that would lead to more meaningful results if this assessment were to be repeated (or adapted to another outcome). Is there a different kind of assessment tool or process that the SAC would like to use for this outcome in the future? If the assessment tool and processes does not need to be revised, please indicate this.**

The inclusion of qualitative questions on the EET112 exam will be implemented in 2014.

Data for the approximately 25 students who started the EET winter track was not collected. A full-time faculty member has been assigned as lead for this outcome. They will be responsible for notifying instructors in all relevant sections and terms in which data needs to be collected, and for the actual collecting of the data. This is expected to increase consistency and compliance with the requirements of this outcome assessment.

Outcome 2 – Assess and create desired digital logic circuit outputs by employing digital logic methods of reduction and analysis

- 1. Describe changes that have been implemented towards improving students' attainment of outcomes that resulted from outcome assessments carried out the previous academic year.**

This year we modified laboratories to include tangible experience to more directly connect theory with practical systems.

- 2. Identify the outcomes assessed this year and describe the methods used. What were the results of the assessment (i.e., what did you learn about how well students are meeting the outcomes)?**

This outcome was assessed using the final exams for EET122.

- 3. Provide information about the results (i.e. what did you learn about how well students are meeting the outcomes)?**

A minimum score of 70% is considered passing with a grade of C. Twenty three out of 27 of the students who took the exam scored a C or better. Fifteen out of the 27 students scored an A or a B. The average score was 80.91%.

Based on these results, the EET department is shown to have accomplished this outcome during the past academic year.

- 4. Identify any changes that should, as a result of this assessment, be implemented to help improve students' attainment of outcomes. (These may include, but are not limited to, changes in curriculum, content, materials, instruction, pedagogy etc).**

Based on the assessment results, no changes are needed.

- 5. Reflect on the effectiveness of this assessment tool and assessment process. Please describe any changes to assessment methodology that would lead to more meaningful results if this assessment were to be repeated (or adapted to another outcome). Is there a different kind of assessment tool or process that the SAC would like to use for this outcome in the future? If the assessment tool and processes does not need to be revised, please indicate this.**

This assessment is good and provides proper data. The inclusion of more practical questions on the EET122 exam will be investigated to probe for deeper understanding of circuit analysis techniques.

Outcome 3 – Simulate, force, and measure DC and AC circuit quantities by using industry standard software and test equipment

- 1. Describe changes that have been implemented towards improving students' attainment of outcomes that resulted from outcome assessments carried out the previous academic year.**

More troubleshooting was added to the EET lab curriculum as a result of last year's assessment. Some procedure steps were removed from labs to enable students to think and work more independently. These changes were well received by the EET advisory board.

- 2. Identify the outcomes assessed this year and describe the methods used. What were the results of the assessment (i.e., what did you learn about how well students are meeting the outcomes)?**

This outcome was assessed using the lab final exams for EET113. Students were assigned a circuit to assemble and collect data from. Students were evaluated according to a rubric (see attachment: **Lab Final Rubric EET113.pdf**).

- 3. Provide information about the results (i.e. what did you learn about how well students are meeting the outcomes)?**

On the evaluating rubric, a score of 0 is 0%, 1 is 65%, 2 is 75%, 3 is 85%, and 4 is 100%. An overall score of at least 70% is considered passing. The fall track students took this lab final exam. None of the approximately 20

winter track students were given this lab final exam during summer of 2013.

The average score was 96.9%. All of the 39 students who took the lab final exam passed.

Based on these results, the EET department is shown to have accomplished this outcome during the past academic year.

- 4. Identify any changes that should, as a result of this assessment, be implemented to help improve students' attainment of outcomes. (These may include, but are not limited to, changes in curriculum, content, materials, instruction, pedagogy etc).**

Based on the assessment results, no changes are needed. Discussion around this topic has revealed a desire among faculty to further include less step-by-step instruction and more troubleshooting for lab assignments.

- 5. Reflect on the effectiveness of this assessment tool and assessment process. Please describe any changes to assessment methodology that would lead to more meaningful results if this assessment were to be repeated (or adapted to another outcome). Is there a different kind of assessment tool or process that the SAC would like to use for this outcome in the future? If the assessment tool and processes does not need to be revised, please indicate this.**

Data for the approximately 20 students who started the EET winter track was not collected. A full-time faculty member has been assigned as lead for this outcome. They will be responsible for notifying instructors in all relevant sections and terms in which data needs to be collected, and for the actual collecting of the data. This is expected to increase consistency and compliance with the requirements of this outcome assessment.

It is believed that the lab final exam could be made more difficult by adding troubleshooting.

Outcome 4 – Communicate effectively both at the individual level and within team settings

- 1. Describe changes that have been implemented towards improving students' attainment of outcomes that resulted from outcome assessments carried out the previous academic year.**

Projects were added that include a presentation in EET-123. We have also increased the number of formal lab report required for our first year classes (EET-112 and EET-113).

In EET-241, formal oral presentations were added to the course and were well received by students. In EET-178, a written project proposal was required along with an oral presentation at the end of the course.

- 2. Identify the outcomes assessed this year and describe the methods used. What were the results of the assessment (i.e., what did you learn about how well students are meeting the outcomes)?**

An oral presentation in EET223 labs was used to assess this outcome. The grading was based on the attached rubric.

- 3. Provide information about the results (i.e. what did you learn about how well students are meeting the outcomes)?**

On the grading rubric, a score of 0 is 0%, 1 is 65%, 2 is 75%, 3 is 85%, and 4 is 100%. An overall score of at least 70% is considered passing. The two categories from the rubric that were used for this assessment were Organization and Presentation. All 38 of the 38 students who took EET223 this past academic year were assigned this presentation and received passing grades.

The average score for the presentation was 89.6%. Overall oral communication was good, students worked well as teams, and a slight decline was noticed between this year and last year's average score. Despite this slight decline, the EET department is shown to have accomplished this outcome during the past academic year.

- 4. Identify any changes that should, as a result of this assessment, be implemented to help improve students' attainment of outcomes. (These may include, but are not limited to, changes in curriculum, content, materials, instruction, pedagogy etc).**

Based on the assessment results, no changes are needed. We may look into adding additional informal presentations to first year classes and formal presentations to second year classes.

- 5. Reflect on the effectiveness of this assessment tool and assessment process. Please describe any changes to assessment methodology that would lead to more meaningful results if this assessment were to be repeated (or adapted to another outcome). Is there a different kind of assessment tool or process that the SAC would like to use for this outcome in the future? If the assessment tool and processes does not need to be revised, please indicate this.**

Rubrics for the assessment of 3rd and 6th term presentations were not aligned. This prevented us from having data that was coherent enough for comparison between the two terms. The same rubric will be used in the future for these two groups of presentations.

A full-time faculty member has been assigned as lead for this outcome. They will be responsible for notifying instructors in all relevant sections and terms in which data needs to be collected, for the actual collecting of the data, and for assuring uniformity in rubrics used. This is expected to increase consistency and compliance with the requirements of this outcome assessment.

Outcome 5 – Carry out instructions and automate highly repetitive or monotonous tasks by utilizing programming skills

- 1. Describe changes that have been implemented towards improving students' attainment of outcomes that resulted from outcome assessments carried out the previous academic year.**

More programming language was added to the program.

- 2. Identify the outcomes assessed this year and describe the methods used. What were the results of the assessment (i.e., what did you learn about how well students are meeting the outcomes)?**

This outcome was assessed using the final lab for EET242.

- 3. Provide information about the results (i.e. what did you learn about how well students are meeting the outcomes)?**

A minimum score of 70% is considered passing with a grade of C. Twenty nine out of 30 of the students who completed the lab scored a C or better. Twenty eight out of the 30 students scored an A or a B. The average score was 95.7%.

Based on these results, the EET department is shown to have accomplished this outcome during the past academic year.

- 4. Identify any changes that should, as a result of this assessment, be implemented to help improve students' attainment of outcomes. (These may include, but are not limited to, changes in curriculum, content, materials, instruction, pedagogy etc).**

Based on the assessment results, no changes are needed.

5. **Reflect on the effectiveness of this assessment tool and assessment process. Please describe any changes to assessment methodology that would lead to more meaningful results if this assessment were to be repeated (or adapted to another outcome). Is there a different kind of assessment tool or process that the SAC would like to use for this outcome in the future? If the assessment tool and processes does not need to be revised, please indicate this.**

This assessment is good and provides proper data, however more students can be included in this assessment.

Outcome 6 – Model and troubleshoot non-linear circuits and systems

1. **Describe changes that have been implemented towards improving students' attainment of outcomes that resulted from outcome assessments carried out the previous academic year.**

Based on last year's results where required items in the lab reports were missing, checklists were included with the assignment to give students a more concise conveyance of expectations.

2. **Identify the outcomes assessed this year and describe the methods used. What were the results of the assessment (i.e., what did you learn about how well students are meeting the outcomes)?**

A formal written lab report in EET222 was used to assess this outcome. The grading was done using the attached rubric.

3. **Provide information about the results (i.e. what did you learn about how well students are meeting the outcomes)?**

On the grading rubric, an overall score of 70% is considered passing. On the rubric, a score of 0 is 0%, 1 is 65%, 2 is 75%, 3 is 85%, and 4 is 100%. The categories from the rubric that were used for this assessment were

Experimental Procedure, Results, and Discussion/Explanation of Results. This data was gathered for 32 of the approximately 45 students who took EET-222 during 2013. The average scores in each category were 86.1% in Experimental Procedure, 84.8% in Results, and 84.7% in Discussion/Explanation of results. The overall average score was 85.7%.

- 4. Identify any changes that should, as a result of this assessment, be implemented to help improve students' attainment of outcomes. (These may include, but are not limited to, changes in curriculum, content, materials, instruction, pedagogy etc).**

Based on the assessment results, no changes are needed. It is thought that periodic status reports may be considered for 2014 to monitor students' progress during the multi-week lab project for which these lab reports were written.

- 5. Reflect on the effectiveness of this assessment tool and assessment process. Please describe any changes to assessment methodology that would lead to more meaningful results if this assessment were to be repeated (or adapted to another outcome). Is there a different kind of assessment tool or process that the SAC would like to use for this outcome in the future? If the assessment tool and processes does not need to be revised, please indicate this.**

There was one section of EET-222 that was not included in this assessment.

A full-time faculty member has been assigned as lead for this outcome. They will be responsible for notifying instructors in all relevant sections and terms in which data needs to be collected, and for the actual collecting of the data. This is expected to increase consistency and compliance with the requirements of this outcome assessment.

EET Degree Outcome Assessment Plan

1. Outcome	2. Maps to a Core Outcome?	3. Assessment Setting/Method	4. When
EET 1yr Certificate			
1) Predict and characterize analog circuit behavior by applying analog circuit analysis techniques.	Critical Thinking, Professional Development	Final Exam for EET112. The exam for this class is intended to test this very skill. A sample exam is included.	2011/2012
2) Assess and create desired digital logic circuit outputs by employing digital logic methods of reduction and analysis.	Critical Thinking, Professional Development	Final Exam for EET122. The exam for this class is intended to test this very skill. Sample exam questions are included.	2011/2012
3) Simulate, force, and measure DC and AC circuit quantities by using industry standard software and test equipment.	Critical Thinking, Professional Development	Lab Final in EET113. A rubric is being developed to aid in grading this experiment. The final may involve constructing or debugging and existing circuit. It will require the student to take measurements and use test equipment to verify proper circuit functionality.	2011/2012
4) Communicate effectively both at the individual level and within team settings.	Communication, Professional Development	Oral Presentations in 3rd and 5th or 6th term. These presentations will be graded using the same rubric. For this assessment only the areas of the rubric that pertain to communication will be evaluated. A draft of the rubric is included.	2011/2012

EET 2yr A.A.S. Degree

- | | | | |
|---|---|---|-----------|
| 5) Carry out instructions and automate highly repetitive or monotonous tasks by utilizing programming skills. | Critical Thinking,
Professional
Development | Lab Final in EET242. The lab experiment will require students to demonstrate that they can create a program to perform a desired task. It will be graded using the same rubric as the EET113 lab final. | 2011/2012 |
| 6) Model and troubleshoot non-linear circuits and systems. | Critical Thinking,
Professional Dev. | Lab Reports from EET 222. The lab reports are graded on a rubric. For this assessment only the data sections will be used. | 2011/2012 |

Biomedical Engineering Technology (A.A.S.)

- | | |
|--|---|
| 7) Communicate in a medical setting using proper medical terminology. (Anatomy and Physiology) | Communication,
Professional
Development |
| 8) Troubleshoot and operate electronic biomedical equipment. | Critical Thinking,
Professional
Development |

Mechatronics/Auto mation/Robotics Engineering Technology (A.A.S.)

- | | |
|----------------------------|--------------------|
| 7) Construct interfaces to | Critical Thinking, |
|----------------------------|--------------------|

electronically control
mechanical systems.

Professional
Development

**Wireless and Data
Communication
Engineering
Technology
(A.A.S.)**

7) Configure and identify
different data and wireless
communication systems.

Critical Thinking,
Professional
Development

**Renewable Energy
Systems
Engineering
Technology
(A.A.S.)**

7) Troubleshoot and
debug alternative power
generation systems by
utilizing interdisciplinary
skills.

Critical Thinking,
Professional
Development

**Renewable Energy
Systems
Engineering
Technology 1yr**

Certificate

5) Troubleshoot and debug alternative power generation systems by utilizing interdisciplinary skills.

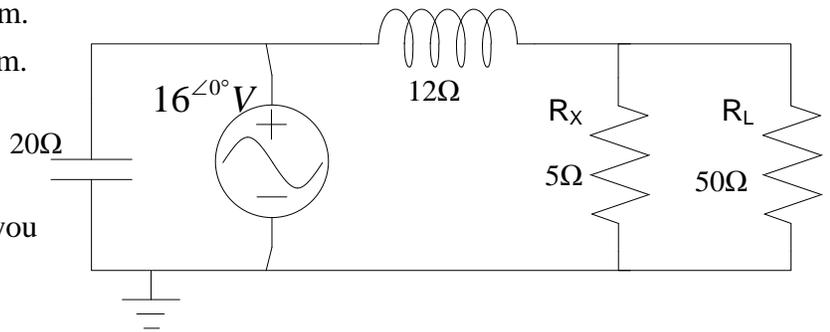
Critical Thinking,
Professional
Development

Name: _____

- Use the scrap paper provided for your work and answers. *Work and answers on the exam sheet(s) will not be graded.*
- This exam has **2** sides.
- Put your name on each sheet.
- Turn in the exam with this sheet stapled on top in the upper left corner. Do not staple over your work, so do not put work where the staple where go.
- There are 265 total points possible.
- Remember to show your work. If your work does not clearly reveal your thought process, partial credit cannot be awarded.
- Express all numerical answers as decimals, not fractions.
- Give all answers to 3 significant figures.
- Draw a **box** around your answers.
- Answers must have **proper units**, if appropriate.

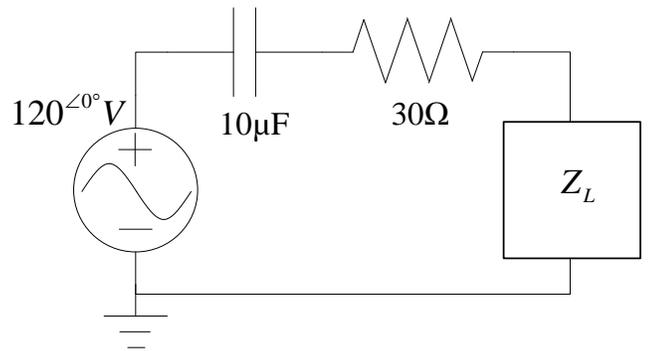
1) Using the circuit below, find the Thevenin equivalent circuit from the perspective of R_L .

- (20pts) Find \widehat{Z}_{th} in polar form.
- (20pts) Find \widehat{V}_{th} in polar form.
- (10pts) Draw the Thevenin equivalent circuit.
- (5pts) To build the Thevenin impedance found in part a), you would use a resistor in series with what type of reactive circuit element?



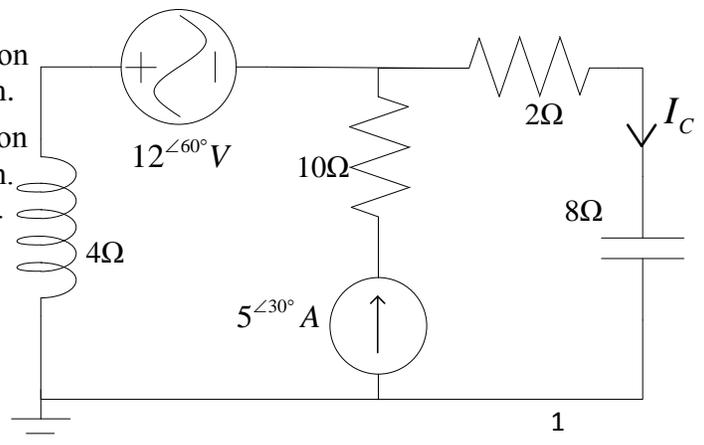
2) The circuit to the right is at a frequency of 60Hz.

- (10pts) Find the load impedance that will yield maximum power dissipated by the load.
- (10pts) Find the maximum power dissipated by the load.



3) Use superposition in the circuit below/to the right to find:

- (20pts) the *voltage* source's contribution to the capacitor's current in polar form.
- (20pts) the *current* source's contribution to the capacitor's current in polar form.
- (10pts) the capacitor's current in polar form.

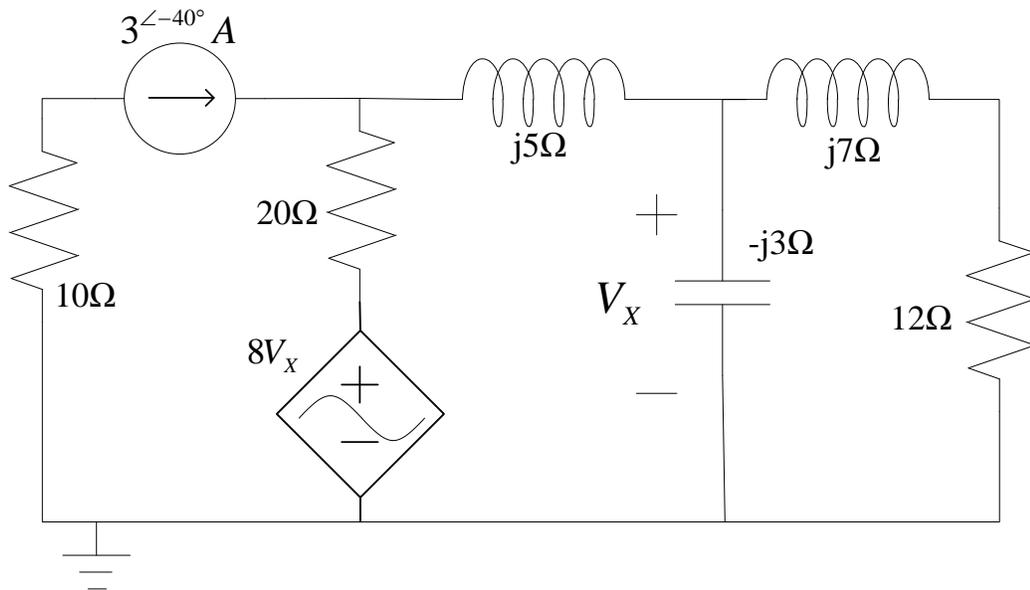


- 4) The voltage across and current through a load are given below as phasors with **peak** magnitudes.

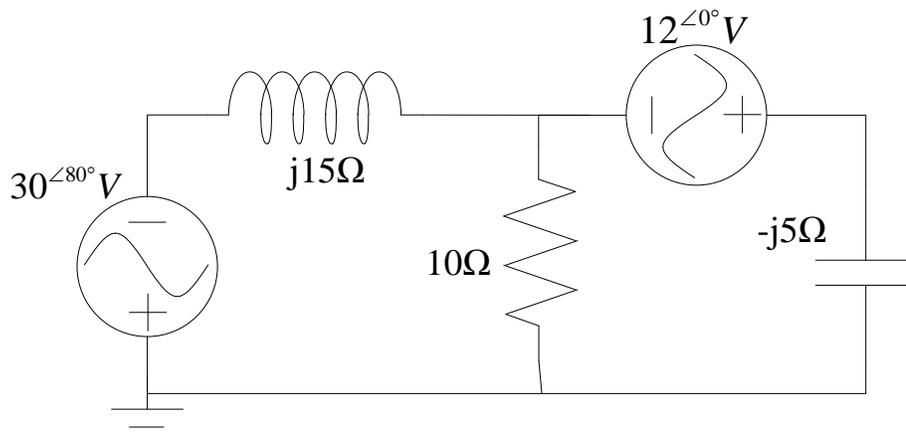
$$V_L = 16^{\angle 45^\circ} \text{ V}$$

$$I_L = 3^{\angle -12^\circ} \text{ A}$$

- a) (10pts) Find the power factor of the load and indicate whether it is leading or lagging.
 b) (10pts) Find the average power consumed by the load.
- 5) (60pts) Use node voltage analysis to solve for the circuit's node voltages in polar form.



- 6) (50pts) Use mesh analysis to solve for the circuit's node voltages in polar form.



	0 Failed	1 Beginning or Incomplete	2 Developing	3 Accomplished	4 Exemplary	Score	Skills That Need Improvement
Operation of Lab Equipment	<ul style="list-style-type: none"> • Demonstrates virtually no knowledge on how to operate lab equipment. 	<ul style="list-style-type: none"> • Requires significant assistance with operation of test equipment. 	<ul style="list-style-type: none"> • Demonstrates difficulties hooking up test equipment to circuit to force and measure quantities. • Requires some assistance with connections or proper equipment settings. 	<ul style="list-style-type: none"> • Demonstrates little difficulty hooking up test equipment to circuit to force and measure quantities. • Seldom needs corrections or adjustments in using the proper test equipment settings. 	<ul style="list-style-type: none"> • Properly hooks up test equipment to circuit to force and measure quantities. • Is able to explain any significant measurement errors introduced by instrument specifications. 		
Use of Circuit Components	<ul style="list-style-type: none"> • Demonstrates nearly no ability in assembling circuit. 	<ul style="list-style-type: none"> • Has trouble identifying circuit components needed for experiment. • Does not have full understanding of breadboard connections. 	<ul style="list-style-type: none"> • Can gather and identify all of the components needed for the circuit in a specific experiment. • Thorough understanding of breadboard connections. • Can assemble a circuit from a schematic diagram with few significant errors. • Has trouble explaining how assembled circuit and the schematic match. 	<ul style="list-style-type: none"> • Correctly assembles all circuit components from a schematic diagram with few, insignificant errors. • Correctly explains how assembled circuit matches schematic, with few, insignificant errors. 	<ul style="list-style-type: none"> • Correctly assembles circuit without errors. • Circuit topology is neat and conducive to troubleshooting. • Correctly explains how assembled circuit matches schematic. 		
Application of Theory	<ul style="list-style-type: none"> • Demonstrates nearly no understanding of relevant theory. 	<ul style="list-style-type: none"> • Cannot explain any of the main theoretical concepts demonstrated by experiment. 	<ul style="list-style-type: none"> • Basic understanding of main theoretical concepts. • Needs some assistance in analysis of results. 	<ul style="list-style-type: none"> • Explains the main theoretical concepts demonstrated by the lab and the causes of significant errors. • Accounts for most significant sources of error. • Able to use theory to identify, troubleshoot, and fix most problems and errors. 	<ul style="list-style-type: none"> • Explains all theoretical concepts demonstrated by the lab. • Explains whether results verify the theory, and the likely cause of any significant deviation from calculated results (error). 		

Lab Report Grading Rubric

Report Title: _____

Name _____

	1 Beginning or incomplete	2 Developing	3 Accomplished	4 Exemplary	Score
Introduction	*Very little background information provided or information is incorrect *Purpose of report or experiment is not explained.	*Background is provided but missing major points *Purpose of report or experiment is not clear	*Background information is only missing some minor points *Purpose of report or experiment is explained.	*All necessary background information is provided *Purpose of report or experiment is clear and concise.	
Experimental procedure	*Missing several important experimental details. *Not written in paragraph format. *Step by Step instructions provided for most of the procedure.	*Written in paragraph format. *Missing some important experimental details. *Many paragraphs provide step by step instructions.	*Written in paragraph format *Important experimental details are covered. *Minor details missing. *Very little step by step instructions.	*Well-written in paragraph format *All experimental details are covered. *No step by step instructions.	
Results	*Results are not provided. *The results contain major errors and are incorrect.	* Most results and calculations are provided. *Some results or calculations are incorrect.	*Most results are presented and are correct. *Supporting calculations provided. *Results and calculations may have some minor errors.	*All results are presented and correct. *Supporting calculations are exact and correct.	
Discussion/ Explanation of Results	*Very incomplete or incorrect explanation of results *Discussion lacks comparison between measured and expected results.	*Some of the results have been correctly interpreted and discussed. *Some of the experimental data is compared to expected data.	*Most of the results have been correctly interpreted and discussed, only minor improvements are needed. *Most measured and expected data values are compared.	*All important trends and data comparisons have been interpreted correctly and discussed, good understanding of results is conveyed *All measured data is compared to expected data.	
Conclusions	*Conclusion started but most important points are missing.	*Conclusions regarding major points are drawn, but many are misstated	*All important conclusions have been drawn, could be better stated *Some minor points are missing.	*All important conclusions have been clearly made, student shows good understanding	
Mechanics: Including Figures, spelling, grammar, sentence structure, appearance and formatting.	*Most figures, graphs, tables contain errors or are poorly constructed, have missing titles, captions or numbers, etc. *Most figures are missing units *Most figures are not referenced in the body of the report *Frequent grammar and/or spelling errors *Writing style is rough and hard to read *Sections are missing or out of order. *Too much handwritten copy *Sloppy formatting –improper line space, section headings missing, title page missing most information. *Sections are of inappropriate length based on material being presented.	*Most figures, graphs, tables OK, some still missing some important or required features. *Most figures contains captions, proper units and are referenced in the body of the report. *Grammar/spelling errors still exist *Generally readable with some rough spots in writing style *All sections included and in order *Report contains the minimum allowable amount of handwritten copy *Formatting is rough but readable – proper line space, section headings included but hard to find. Not enough white space. Title page contains most required information. *Sections are of inappropriate length based on material being presented.	*All figures, graphs, tables are correctly drawn, but some have minor problems or could still be improved. *A few figures still exist without a caption or a reference in the text body. *Few grammar/spelling errors. *Writing style is readable. *All sections included and in order *Formatting generally good but could still be improved – Title page still missing some information, white space could be improved. *Sections are mostly of a length appropriate for the material presented.	*All figures, graphs, tables are correctly drawn, are numbered and contain titles/captions *All figures are correctly referenced in the body of the report *All grammar/spelling correct *Writing style is very readable and clear. *All sections included and in order *Report is well formatted *Sections are of length appropriate for the material presented.	
			12/11	Total (24 points maximum)	

Oral Report Grading Rubric

Report Title: _____

Name _____

	1 Beginning or incomplete	2 Developing	3 Accomplished	4 Exemplary	Score
Organization	<ul style="list-style-type: none"> * Audience cannot understand presentation because there is no sequence of information * Presentation is significantly over or under time limit. * Outline and Conclusion slide missing * Title slide missing most of the required components. 	<ul style="list-style-type: none"> * Audience has difficulty following presentation because student jumps around. * Presentation is over or under the time limit. * Outline or Conclusion slide is missing. * Many of the title slide components are missing. 	<ul style="list-style-type: none"> * Student presents information in logical sequence which audience can follow with some effort. * Presentation occasionally loses its purpose or train of thought. * Presentation barely over or under time limit * Outline and Conclusion slides included. * Title slide is missing a minimal amount of information. 	<ul style="list-style-type: none"> * Student presents information in logical, interesting sequence which audience can follow. * Presentation is the right amount of time. * Presentation includes complete title, outline, and conclusion slides. 	
Content	<ul style="list-style-type: none"> * Correlation between theory and experimental results is incorrect. * After outline, viewer has does not know what they will learn from this presentation. * Data does not support the defined outline. * Data is incorrect and/or incomplete. * Conclusions are incorrect or missing 	<ul style="list-style-type: none"> * Missing correlation between theory and experimental results. * Outline does not provide a clear picture of what viewer will learn in this presentation. Viewer may have some idea, but they don't know for sure until the conclusion. * Data presented is often incorrect or incomplete. * Some conclusions correctly drawn from data. * Data relevant to the experiment and conclusions is missing 	<ul style="list-style-type: none"> * Some correlation of theory and experimental results presented. * Outline provides a mostly clear picture of what viewer can hope to learn from this experiment. Viewer has minor questions as to why presentation is being given. * Most data presented is correct and relevant to goal of the experiment. * Most conclusions are appropriately drawn * Some information is missing that would support conclusions 	<ul style="list-style-type: none"> * Provides evidence that correlates theory to experimental results * From Outline it is obvious what the viewer can hope to learn from this presentation. * All data presented is correct and relevant to outline presented. * All and correct Conclusions are drawn * All information needed to draw the same conclusions is presented and explained. 	
Demonstration	Student does not provide information relating to the functionality of the project.	Student provides information showing basic functionality of project. However, data is missing showing major functionality of major components. Student is unable to explain erroneous data.	Student's demonstration provides information necessary to illustrate how the project functions. Not all functionality is illustrated or explained.	Student shows a complete demonstration. Providing all necessary information to illustrate proper functionality of the project	
Questions and Answers	Student does not have grasp of information; student cannot answer questions about subject.	Student is uncomfortable with information and is able to answer only rudimentary questions.	Student is at ease with information and explains expected answers to all questions, but fails to elaborate.	Student demonstrates full knowledge (more than required) by answering all class questions with explanations and elaboration.	
Presentation: Language Use, Delivery, and Graphics (including tables, plots, and bullets)	<ul style="list-style-type: none"> * Student uses superfluous graphics or no graphics. * Slides themselves are not readable. * Bullets not used or are too long to fully comprehend. * Student's presentation has many spelling errors and/or grammatical errors. * Student reads all of report with no eye contact. * Student mumbles, incorrectly pronounces terms, and speaks too quietly for students in the back of class to hear. * Student is inappropriately dressed. 	<ul style="list-style-type: none"> * Student occasionally uses graphics that rarely support text and presentation. * Slides are hard to read or understand. * Bullets regularly attempt to convey too much information * Presentation has some misspellings and/or grammatical errors. * Student occasionally uses eye contact, but still reads most of report. * Student incorrectly pronounces terms. * Student's voice is low. Audience members have difficulty hearing presentation. * Student is inappropriately dressed. 	<ul style="list-style-type: none"> * Student's graphics relate to text and presentation. * Slides are readable and understandable. * Bullets are concise and easy to understand * Presentation only a minimal misspellings and/or grammatical errors. * Student maintains eye contact most of the time but frequently returns to notes. * Student's voice is clear. Student pronounces most words correctly. Most audience members can hear presentation. * Student is appropriately dressed. 	<ul style="list-style-type: none"> * Student's graphics explain and reinforce screen text and presentation. It is obvious what information the slide is trying to convey. * Presentation has no misspellings or grammatical errors. * Student maintains eye contact with audience, seldom returning to notes. * Student uses a clear voice and correct, precise pronunciation of terms so that all audience members can hear presentation. * Student is appropriately dressed. 	
			03/11	Total (20 points maximum)	