Lab Syllabus EE 2006 Fall 2015

Lab Schedule
Labs will be posted on the course webpage.

Grading

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attendance</td>
<td>3</td>
</tr>
<tr>
<td>Report</td>
<td>12</td>
</tr>
<tr>
<td>PSpice®</td>
<td>5</td>
</tr>
<tr>
<td>Pre-Lab</td>
<td>5</td>
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</tbody>
</table>

Lab Policy

1. Lab reports are due the week following the lab exercise at the beginning of the lab section. Late lab reports will subtract the number of days from the allotted 3 total late days from each member.
2. Re-schedule of lab session is not allowed. Exception is made only for justified reasons and must have my pre-approval.
3. Although data is taken in groups, reports presented must reflect individual effort. Any plagiarized work will receive no credit for all students involved and will be referred to University officials. Repeated plagiarism will result in a course grade of an F for all students involved.

Pre-Lab

Several of the final labs require a pre-lab that is to be completed and presented prior to beginning the lab exercise. Students should start early on pre-labs as difficulty may be encountered. This will leave time to contact the professor and/or teaching assistant(s) with questions.

Report Content

Reports will be graded according to the grading matrix at the end of this document. Each of the following should be included in all reports:

**Report Header**

Each lab report must contain a header or title page that specifies the following:
- Student name and partner name
- Course number
- Lab number and title
- Date of lab exercise

**Introduction**

An introduction must be presented at the beginning of the report that introduces the objectives of the experiment and details at least one assumption and one constraint.

**Procedure and Equipment**

The student should next include all equipment used in report in bullet format. This should include a listing of instruments, specific passive components with values and any integrated circuits.

**Results**

The results section should provide a brief overview of the procedure that was followed during the course of the lab; narrating what was performed and presenting data collected, calculations required, screenshot taken and schematics of circuits constructed.

Any table in the lab procedure that is provided to temporarily record information must be presented in the report. Present this information and the required calculations in a clean, easy to read manner. Do not write out this vital information within a paragraph. This will often include (but not be necessarily limited to) a data entry page.

Oscilloscope and PSpice® screenshots must be rotated and cropped accordingly in the report. These figures, along with any other figure or table in a lab must be given a number, title, and referred to in the body of the text.
Pre-Lab results will be entered in the data entry page. Please show calculations where necessary. PSpice® is required for several labs and is to be included in the lab report. Regardless of what the lab exercise states, the PSpice® schematic screenshot must be included as corroboration of your efforts. Results obtained by PSpice® may be presented as data within the report. Voltage or current traces with respect to time or frequency are sometimes required. Screenshots of these traces should be cropped and labeled as figures.

**Conclusion**

All questions asked at the end of the lab exercises should be answered in full sentence form. Please insert paragraph breaks where necessary.

An overall impression of the lab should be presented that also describes any difficulties encountered. Deductions may be received for irregularities in calculations not noted in the conclusion.

*Lab reports must be submitted as a word processed document with all figures and calculations included within the document’s content.*

**Appendices**

A pre-lab worksheet will be required for several of the labs later in the semester. If this is the case, you can attach the pre-lab worksheet to the back of your lab report. When this is done, the pre-lab should be labeled as “Appendix A” (or B, C, etc. if there are multiple appendices) and referred to as such in the report.

*** Be sure to ask me for help or tips on formatting your lab report. Some general tips are:

- Images and figures should be kept to a maximum size of about 5”x7”
- Be sure that any plots and graphs that are included are easily visible. Plots with black backgrounds are often difficult to see.
- Clear communication is very important in lab reports, so read things over to ensure that everything is clear and concise. If English is not your first language, please have someone for whom English is proofread your report.
- Put everything in your own words. Although the work is done in pairs or groups in the lab, the lab reports are meant to be completely individual. Only data and images need to be shared.

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**SAMPLE LAB REPORT FOR EE 2006**

Jing Bai  
Partner: XX XXX  
EE 2006  
Lab #1: Example Report  
Performed: September 14, 2015  
Due: September 21, 2015  
Lab TA: XXX

1. **Introduction and Background**

The following two pages are presented as an example report, based on a sample report from Scott Norr [1]. The report for the lab should describe any objectives in your own words. What is to be done? What is to be learned? Which concepts are applied? At least one assumption and one constraint must be given also. Three sentence minimum.

2. **Procedure**
A brief overview of the lab procedure should be given here. The main steps taken to perform the lab should be given rather than the main goals (which should be included above in the Introduction). The overview should summarize the procedure such that an individual who is not familiar with the lab will be able to understand it. Results should **not** be included here.

### 2.1. Equipment List

Provide a list of equipment that was used. You don’t need to include EVERYTHING (i.e. connectors, wires, computers, printers, etc.), but just the key elements such as electronic tools in the lab, specific software programs, or electrical components. For example:

- Digital Oscilloscope
- DC Power Supply
- Resistors (51Ω, 51Ω, 120 kΩ)
- Capacitor (0.1 uF)

### 3. Results

Describe the results of each portion of the procedure. Include diagrams of circuits constructed, oscilloscope screen shots of key waveforms and tables with data observed and recorded. Figures that are included in your report should be large enough to see and read, but rarely need to exceed about 5 x 7” maximum—don’t use full sheets of paper for individual images (this will save you ink and paper!!). These figures should be incorporated in the word processed document, presented in chronological order, and labeled. Figure titles should be below the figure while table titles should be included above the table.

Along with the results, include:

#### 3.1 Sample Calculations/Equations

Some (but not all) of the labs will require theoretical calculations using several equations. If this is the case, include the equations that you are using. Also, show your work for at least one instance of each equation involved (in other words, if several calculations use the same equations but different sets of values, you only need to show the calculations for one set of values). **It's much easier to give partial credit for your work if the work is shown!** This work can either be included within the Results section, or if there is a lot of hand-calculation, it’s good to attach a separate sheet of calculations, neatly organized and written in ink—if you do this, label the page as an appendix and refer to it in the body of the report.

### 4. Conclusions

Summarize the data and analyze the results. What did you learn? Also, answer all questions that appeared at the end of the lab instructions, if any. The conclusion should be a paragraph with a minimum of 5 sentences. Note: if there are questions at the end of the lab instructions, the answers to the questions are only a PART of the conclusion. Additional comments are required.

### 5. References

# EE 2006 Fall 2015 Laboratory Report Grading Matrix

Student: ____________________________________________  Lab : # 1 (Multimeter)

<table>
<thead>
<tr>
<th>Attribute (2 pts each)</th>
<th>0 - 0.6 Unacceptable</th>
<th>0.6 - 1.2 Below Expectations</th>
<th>1.2 - 1.9 Meets Expectations</th>
<th>1.9 - 2.0 Exceeds Expectations</th>
<th>Points Awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Report Mechanics</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Format and Organization</td>
<td>Inappropriate content in most sections of report, tables and figures cannot be read/understood, fonts difficult to read, so many format errors as to make the report useless</td>
<td>Some portions are sloppy, difficult to read, contain some format errors or are attached at the end of the report</td>
<td>Content appropriate in all sections of report, text, tables, figures are readable and understandable.</td>
<td>Organization enhances readability and/or understandability of report, text, tables, figures so clear and understandable as to enhance the report’s impact, unique format enhances report’s impact</td>
<td></td>
</tr>
<tr>
<td>Grammar, Punctuation, Spelling</td>
<td>Excessive spelling, grammar, and punctuation errors</td>
<td>Some spelling, grammar, and punctuation errors</td>
<td>Only a few spelling, grammar, and punctuation errors</td>
<td>Completely free of spelling, grammar, and punctuation errors</td>
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</tr>
<tr>
<td><strong>Content</strong></td>
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<tr>
<td>Introduction and Procedure</td>
<td>Problem not stated, constraints or assumptions not explained, contains results/conclusions, procedure not included</td>
<td>Problem stated poorly, limited discussion of constraints, assumptions, procedure verbatim from provided document or incomplete</td>
<td>Problem clearly stated, impact of constraints and assumptions clearly discussed, procedure well stated, but limited to obvious steps</td>
<td>So clear and complete as to enhance impact of report, procedure complete, including deviations from provided document</td>
<td></td>
</tr>
<tr>
<td>Results (double—worth 4 pts)</td>
<td>No apparent understanding of lab tasks, no quantitative support provided</td>
<td>Poor understanding of lab tasks, poor quantitative support</td>
<td>Lab tasks clearly understood and discussed, solid quantitative support</td>
<td>Discussion clearly reveals insight and understanding beyond level expected</td>
<td></td>
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<tr>
<td>Conclusion and Consideration Questions—What did you learn?</td>
<td>Omitted</td>
<td>Weak, poor understanding in answers to questions</td>
<td>Clear conclusions, questions answered well</td>
<td>Conclusions/answers clearly reveal insight and understanding beyond level expected</td>
<td></td>
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<table>
<thead>
<tr>
<th>Report Total (12 pts)</th>
<th>Attendance (3 pts)</th>
<th>Prelab* (5 pts)</th>
<th>PSpice* (5 pts)</th>
<th>Total Pts</th>
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<tr>
<td></td>
<td></td>
<td>(* - if applicable)</td>
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