CPE 409F13 Lab Technical Report and Lab Grading

## Technical Report

The technical report shall be created with a word processing program. Please write up your technical report with the following sections:

### Goal

What is the purpose of this lab?

### Equipment used

List all the equipment used in this lab. Include enough information that someone could get the equipment listed and repeat what you did in lab. You should include the versions numbers of the software used.

### Design Specification

List the specifications that your design must meet. This information comes from the lab instruction usually. Some interpretation of the instructions might be needed to write succinct, verifiable specifications. The specification should be written like: “The program shall do X.”

### Design

Describe your design (software in this case). Software must be described by a flow chart or a state diagram. Finally list your well commented final code, this can be done with a simple copy and paste into your word document (please take out extra lines sing paragraph line spacing commands). Remember to include a proper header and comments in your code.

### Verification

Describe how you verified that your design meets all the design specifications. If it is not obvious give a procedure in how the verification was done. List all data that was gathered (this should come from your lab book). Describe all analysis done on the data gathered. You are encouraged to use graphs and diagrams if appropriate. Someone should be able to use your lab book and independently run through the verification. (This could be important if someone wanted to see the effects of a modification of your design.)

### Questions

If the lab has questions please answer them in this section.

### Conclusions and Limitations

Describe what can be logically concluded from your work. State the limitations to these conclusions. State what you learned that you might apply in other projects. If you want you can also list future work that you would like to do or explore that is related to this lab

## Proof of completion

With your report include any necessary instructor signatures. Since completion of the project proved by a signature is a large part of the lab grade please do not forget to include it with your report.

### Grading Procedure

Your lab grade will be calculated as:

* 50% of the grade will be based on getting a design that works and if specified demonstrated to the lab instructor.
* 25% will be based upon answering questions posed by the lab. (If no questions the 25% is added to the working design 50% for a total of 75% of the grade.)
* 25% will be on your lab behaviors and the write up of your lab as shown in the following rubric.

### The labs will be graded using the following rubric. Note, not every rubric item will be applicable for all labs. For this class items 1.4, 2.2, 3.1, 3.2, and 3.3, will be ignored.

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| ***Table 1. Detailed, Multi-Dimensional Rubric for Outcome e*** | | | | | |
| Attribute | Performance | | | | |
| 1 | 2 | 3 | 4 | 5 |
| Unacceptable | Inadequate | Adequate | Competent | Superior |
| ***1. Ability to Design Experiments*** | | | | | |
| 1.1 Selects appropriate instruments and techniques | Selects wrong instr/tech, has no idea what to select | Sometimes makes appropriate selection | Makes appropriate selection with assistance | Makes appropriate selection within educational background | Finds new and appropriate instr/tech |
| 1.2 Connects to classroom learning | Unable to connect,  has no ammunition | Sees experiments and classroom learning as disconnected | Makes the connection with guidance | Initiates the connection, asks questions | Seeks additional connection between concepts and experiments |
| 1.3 Appropriate Range | No plan | Poor planning leads to missing data points | Normally uses good plan, recognizes errors and repeats experiment when necessary | Clear plan. Often checks results for validity during experiment. | Excellent plan, anticipating use and analysis of data. Checks results for validity during experiment. |
| 1.4 Safety | Disregards safety issues | Considers safety when reminded | Follows all generally stated safety precautions and applies to particular experiments | Careful consideration of safety, sometimes recommends improvements | Careful consideration of safety, clear documentation, recommends improvements |
| 1.5 Limitations | Limitation of experiment are not recognized | Limitations are recognized but do not inform the experiment | Limitations are recognized and experiment is changed to maintain goal of experiment | Same as adequate level and they are clearly stated in the report | Same as competent and a plan for future experimentation is stated |
| ***2. Ability to Conduct Experiments*** | | | | | |
| 2.1 Skill | Incapable of using techniques or instruments | Can use with outside assistance | Uses with skill using written instructions or manuals | Uses with skill and recognizes some limitations of the technique or instrument | Uses with skill and recognizes unstated or undocumented limitations of the instrument |
| 2.2 Statistics | No working knowledge of statistics | Understands and applies basic concepts in an intuitive, but not always accurate approach | Collects data recognizing statistical concepts, and guidelines as presented by the instructor. | Collects data recognizing statistical concepts, and guidelines as presented by the instructor and from other sources | Collects data recognizing and extending statistical concepts, and guidelines as presented by the instructor and from other sources |
| 2.3 Documentation of procedure | No records | Poor records with missing steps | Complete records | . Complete records with some clarifying details, sketches, etc | Complete records with clarifying details, sketches, etc |
| 2.4 Records | Much missing data | Some missing data | Complete data, allowing for some clearly documented additions | Complete data, with some comments | Complete data, with thorough comments and observations |
| 2.5 Problem identification | Wouldn’t know if the experiment failed | Senses a problem, but takes little/no action | Sees a problem and comments in documentation | Sees a problem and takes corrective action | Sees a problem, analyzes the problem, and takes corrective action |
| ***3. Ability to Analyze Data*** | | | | | |
| 3.1 Graphs/tables | Frequent errors in formatting or labeling | Several errors in formatting or labeling | Properly formatted and labeled | Clear and easy to read | Near-perfect and easy to follow  (practically perfect in every way) ☺ |
| 3.2 Use of statistics | Use of wrong techniques, neglects statistical analysis | Incorrect use of techniques as suggested by the instructor | Correctly uses techniques as suggested by the instructor with some assistance | Correctly uses techniques as suggested by the instructor | Independently identifies and uses correct techniques |
| 3.3 Physical laws | Does not understand the laws or apply appropriately | Some understanding, with frequent errors in application | Fundamental understanding of laws and application as presented by instructor | Understands and applies physical laws and recognizes level of approximation |  |
| 3.4 Presentation | Presents results in disorganized manner, often without units, comparison to literature values, or relative error | Presents results in some organized form, but sometimes lack units, comparison to literature values, relative error | Presents results in an organized form with few mistakes but does not integrate portions of the experiment together | Presents results in an organized form no or minor mistakes some parts of the experiment are integrated together | Presents results flawlessly, integrates data into on coherent set of data |