**A.P.E.S. – FORMAL LAB REPORT FORMAT-**

**Setup:**

• The lab report must be **typed**, in 12 point font, preferably Times New Roman.

• White paper must be used.

• No graphics as decoration

**General language:**

• Avoid the use of “I, me, you, he, she, we, us, they” or any such terms.

• Avoid slang (“compressed” instead of “squished”).

**Title page:**

• Experiment title, lab partners (use full names; student author listed first), due date, Class, Block/Section

• 12 point font, preferably Times New Roman

• No graphics as decoration

**Abstract: (75 word limit Included on title page)**

Technical papers have a short abstract for the purpose of describing the essential results, so that indexing services can search for key terms to classify the paper. The abstract should be written last and contain a concise description of the topic and your key experimental results. Engineers agonize over every word in an abstract in order to maximize its information content, while not bending the rules of English grammar to the point of unintelligibility.

1. **Introduction: (First page)**

This section primarily tells the reader enough background information to understand (i) the technical essentials and (ii) the goal of the measurements. i.e. The purpose of the “Tragedy of the Commons” simulation and proposed concept background material i.e. Who is Garret Hardin? Copying or paraphrasing the relevant sections of the lab manual is *not* adequate. You should include references to the textbook and other material that you find helpful in providing the background information.

1. **Materials:** complete list
2. **Procedure:**

• Detailed steps in order, can be written in paragraph form or numbered format

• **use passive voice**:

Correct: “The beaker was filled with water.”

Incorrect: “Fill the beaker with water.” or “We filled the beaker with water.”

If the procedure was changed from the original lab sheet, write what was done by the students, not what was originally written.graphs, tables, etc.

1. **Data:**

• Graphs must have a title and have each axis clearly labeled.

• Tables must be clearly labeled.

• Diagrams must be clearly labeled.

• When using colors, display a color key.

• Use a ruler for any lines drawn.

• Anecdotal logs (descriptive data) should have dates for entries.

1. **Calculations:** clearly label all calculations; watch units (significant figures are not emphasized in APES)
2. **Discussion:** interpretation and analysis.

• Explain your results in terms of the objectives, theory, and background information.

• Compare expected results with experimental results, and account for any differences.

• Compare your results to those of other lab groups, and discuss similarities and differences.

1. **Error Analysis:** (when applicable)

• Percent error = (|ACTUAL – THEORETICAL|) / THEORETICAL x 100

• Focus on equipment or other circumstances but *not* human error!

1. **Conclusion/Results:** The final section involves your interpretation of the experimental results and analysis. You should include enough theoretical background for the reader to understand the principles behind the equations. The origin and assumptions behind the equations used in

analyzing your data should be discussed. The textbook and lab manual are not sufficient

for this purpose; you should look into other references. Furthermore, you should interpret your results and your level of confidence in them. Are they reasonable and consistent with the literature? They should be presented in the standard form.

1. **Questions:** (when applicable) pre-lab and/or post-lab questions. Answer in complete sentences. You do not have to rewrite the questions.

**References:** Use proper citation format (MLA or APA)