Prof. Lester's BIOL 150L
Enzyme Experimental Design Worksheet – Graded (50 points)

Group Members:

1. **Observation:** Temperature affects enzyme activity. Each enzyme has an optimal temperature at which it functions best.

2. **Question:** Do enzymes from different organisms have different optimal temperatures?

3. **Hypothesis:** The optimal temperature for fungal amylase, human amylase, and bacterial amylase are different.

Each group will test only one type of amylase. Class data will be combined.

4. **Experimental Design:**

   a. Identify the experimental groups. (2 points)

   b. Identify the control groups. (2 points)

   c. Identify the independent variable: (2 points)

   d. Identify the dependent variable: (2 points)

   e. List equipment and solutions needed for your experiment including amounts. (2 points)

   f. Describe your experimental procedures step-by-step. (4 points)

5. Data Tables (remember to include labels) (6 points)
   a. Include raw data absorbance values (average class data for each enzyme)
   b. Enzyme activity for all three enzymes (mg/ml)

6. Graphs (use TAILS) (6 points)
   - include the standard curve done previously
   - graph of your enzyme data by itself
   - graph of average class data (all three enzymes and their activities)

7. Conclusions: (24 points total)
   a. What are the optimal temperatures for each type of amylase? (3 points)

   b. Did you expect the optimal temperatures to be different? Why or why not? If they are different, try to explain why for each type of amylase. Lots of writing here. Include what you learned from the bioinformatics lab to discuss your results. (Use of external sources requires that you must cite them in the text and include a reference page at the end. If you do not include references, you will receive zero points for this section.) (13 points = 10 for discussion, 3 for correct citations in body of text)

   c. Did you find something unexpected from human amylase or any of the other amylases? Suggest possible explanations for the apparent anomaly. Be thoughtful and creative. (4 points)

   d. Sources of experimental error. What was done or not done that may have contributed to the results. (4 points)