

**Spring 2020 PHY 451 Advanced Laboratory – Laboratory Notebook Evaluation Rubric**

<b>Aspect/weight</b>	<b>Below Expectations (1-3)</b>	<b>Meets expectations (4-7)</b>	<b>Exceeds Expectations (8-10)</b>	<b>Score</b>
<b>Notebook hygiene (25%)</b>				
Writing mechanics (10%)	Parts of the notebook are difficult for a third party to decipher; errors are completely blocked out rather than just marked with a single through-strike	Completely readable by a third party but requires some effort; occasionally too crowded, especially when errors or other material are crossed out	Easy for a third party to read; not crowded nor excessively spaced out; easy to decipher what is crossed out	
Organization (15%)	Incomplete table of contents; requires significant effort by a third-party to find information they may be looking for (e.g., different kinds of information such as procedures, results, and analysis not clearly distinguished by sectioning, headings, etc.)	Complete table of contents; logical flow of notes; third-party can find the information they might seek without too much effort; no significant empty spaces that might be filled in after the fact	Table of contents complete but not so detailed as to be difficult to use; clear sectioning facilitating rapid differentiation between different aspects of the record: e.g., methods versus results, trial measurements versus final data sets	
<b>Preparatory work (15%)</b>				
Introduction (5%)	Minimal or incorrect explanation of the experiments and their context or goals	Clear understanding and exposition of the purpose of the experiments and techniques	Clear explanation of context and why the technical approach is chosen	
Experiment Outline (5%)	Incomplete list of plans and insufficient details explaining the reasons for the steps	Complete list of plans but some details missing; plans appropriately updated as the project evolves	Complete list of activities with detailed descriptions of the steps to be taken and the purpose of those steps and their order	
Calculations (5%)	Incomplete or incorrect calculations	Substantially complete and correct calculations and explanation of steps that are not self-evident	Complete and correct calculations with clear discussion of their relevance and meaning	

<b>Experimental work (40%)</b>				
Records of methods (10%)	Incomplete discussion of procedures	Clear record of experimental procedures including equipment settings, deviations from planned procedures	Clear discussion of the fundamental reasons behind experimental choices; minimal unnecessary detail	
Observational data (10%)	Inadequate evidence of more than mechanically carrying out steps; no obvious checks of whether steps of the procedure are yielding qualitatively expected results	Clear pictures or sketches of observations	Clear discussion of what the observations mean, clear presentations of anomalies or unexpected observations	
Quantitative data (20%)	Data not easily understood by reader; incomplete achievement of experimental goals; frequently obtain incorrect results	Substantially (at least 75%) complete and correct set of data; data are well organized, plotted or tabulated in easy to read and recognize ways	Data are presented in a well considered, effective form (e.g., choices of linear, semi-log, or log plots); all experimental goals completed; data is correct	
<b>Post-experiment (20%)</b>				
Data analysis (15%)	Incomplete or incorrect analysis of primary data; incorrect or incomplete accounting of uncertainties on primary experiments	Data on principal questions is correctly analyzed with few errors; uncertainties are reasonably accounted for	Complete and correct analysis; uncertainties are fully and correctly accounted for	
Summary (5%)	Incomplete or inaccurate summary of primary observations	Complete, correct summary of primary observations and conclusions	Complete summary of observations and conclusions; discusses deviations from expectations or plans; discusses further experiments that might be done to buttress the results or address uncertainties	
<b>Total</b>				