

ASTR135 LAB GRADING RUBRIC rev. 1/04

MECHANICS [25 points]

1. Prose - is clear, concise, correct, unambiguous, original, and formatted. Note that cases of plagiarism will be referred directly to the prof.

0	1	2	3	4	5
Prose is garbled and nonsensical		The meaning is mostly clear but occasionally awkward, short, lengthy, ambiguous, imprecise		The writer has restated everything into his/her own words, there is no ambiguity	

2. Data - are clear, complete, and appropriately presented, e.g., lines are only used to join points on a graph if interpolation and continuity is to be communicated.

0	1	2	3	4	5
Data are missing or disorganized		Data are merely tabulated, minimal explanation, presence/absence of patterns may be recognized		Data are tabulated, the absence/presence of patterns is recognized, the presentation communicates the proper interpretation	

3. Calculations - derived quantities are correct.

0	1	2	3	4	5
Absent or incorrect		Mostly correct, lacking in attention to significant figures and dimensional analysis		Correct, appropriate precision is quoted, units are carried through equations and are consistent throughout	

4. Conclusions - understands how to interpret the data in a consistent and sensible manner.

Consider the following questions: Are the conclusions suggested by the data? Do the conclusions address the goals? In the presence of alternate interpretations, is the most correct conclusion drawn? Is the conclusion defensible/justifiable?

0	1	2	3	4	5
Interpretation weak, missing or incorrect		Interpretation is consistent with, but a repetition of, the goal		Interpretation is logical and convincing	

5. Accuracy - lab tasks were performed with care to minimize random errors.

0	1	2	3	4	5
Tasks were performed hastily, carelessly, or incompletely		Lab is mostly complete, some thought given to how to achieve good results		Lab is complete, accurate, and performed with deliberateness and attention to detail in the method, attempt made to minimize random errors	

CRITICAL THINKING [25 points]

6. Goal - understands the purpose/goal of the lab in the correct context.

0	1	2	3	4	5
Purpose is missing or incorrect		Purpose is stated but is drawn from the lab sheets		Purpose is stated in the context of astronomy and the scientific method	

7. Procedure - understands the sequential nature of the lab.

How does the exercise's procedure lead directly to the final result? Can the result be improved upon (i.e., made more believable)? Given a lot more time, how would you change the procedure? Can the data quality and/or quantity be improved?

0	1	2	3	4	5
Procedural summary is absent or copied from the lab sheets		Procedural summary is paraphrased, concise, some sense of flow, tendency to be in cookbook format		Procedural summary is paraphrased as a means to an end, the underlying principles are understood	

8. Assumptions - understands the assumptions, simplifications, and/or systematic errors that support the procedure (i.e., WHY the lab achieves the desired result).

0	1	2	3	4	5
No recognition of assumptions or built-in errors		Recognition of assumptions and errors, but is unable to justify an opinion regarding the size of errors		Understands the assumptions, can quantify and/or defend errors	

9. Consequences - understands the implications of the conclusion.

Work beyond the conclusions: the lab result can suggest consequences, implications, or have a wider applicability, e.g., would a conclusion about our solar system be true for each individual planet (deduction), or is a conclusion a part of a larger body of physical processes (induction)?

0	1	2	3	4	5
Missing or misguided attempt to extrapolate conclusions beyond the stated goal		Recognizes a few select applications of the results		Broad viewpoint that empowers prediction	

10. Perspective - Understands and employs the verification of the results with an independent authority.

All of the lab exercises have been performed, on a grand scale, by professional scientists. Literature searches will reveal their results. How do your results compare? Does it help to compare your results with the other students?

0	1	2	3	4	5
Verification is missing, copied from the lab sheets, or incorrect		Verification is made without reference to its authority or to alternate viewpoints (if applicable)		Authoritative verification is made, contrasted with alternate viewpoints if applicable	