

## Grading Undergraduate Research

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Research courses are not the same as a standard lecture/discussion class. In standard courses, you generally work with known facts; in research we work in the unknown. In standard courses, your grade is determined by your ability to answer questions; in research, it is by your ability to ask, strategize, and answer questions. In standard courses, you can ask the professor or look up the answer; in research, the professor is just as much in the dark as you. In standard courses there are standard metrics for grading; in research these same standards are more elusive.

These considerations mean that grading is different in research courses. Below are the criteria and areas I will “grade.” Note they cover a lot of ground, and not all areas pertain to each student. Note that it would be difficult for all of this to apply, but if you excel in these areas you will have a very excellent letter of recommendation later on in your career.

### Quality of Work

The single biggest area for grade consideration is your work effort. If you don’t work at this, it will be reflected in your grade. Things I will look for:

Careful work – Careless work is not desirable. Check what you are doing as if the existence of the human race depends upon your work (OK a bit much but you get the idea).

Initiative Students should try to go beyond what is in front of them. Students that push the boundary of knowledge and look beyond the obvious will receive better grades.

Results- “Good” research results are great, but understand that “bad” results are not necessarily imply a bad grade. Sometimes the best results are the “bad” ones. What matters more is how you approach the results (See below).

Consistency I expect you to contact me each week with progress on your work. Students are to remain in contact with the lab, and are not permitted skip for weeks because of other obligations. I realize that finals/emergencies etc. naturally interfere with your work schedule and this is fine; just let me know what is happening.

Notebooks- Every student is required to keep a laboratory notebook. These notebooks are property of the lab. I won’t grade the material in the notebook per se, but you should be able to point to where you recorded experiments etc in your notebooks if asked.

### Attendance at meetings

Students are required to attend the Undergraduate Research meeting. At the beginning of each quarter, you should give me a copy of your schedule as soon as possible and I will come up with a meeting time for the group. If you have a conflict that is OK, but you need to make other arrangements with me. Take note of “Consistency” above.

**Read/study a scientific paper**

Students will read one scientific paper each quarter. This can be one paper that I pick, or one that you pick. Any paper you pick has to be shown to me first. The paper should have some relevance to your work, either in terms of biology/physiology, medicine, technology, or physics.

**Presentation of work**

Your ability to explain your results is very important. Throughout the quarter, you will be asked to summarize your results for the group. These are not “formal” presentations. The ability to defend your results and question your data is one of the most important skills you can develop in research. Students should competently defend their results and explain what problems/successes arose. More senior students may also be asked to give a more formal presentation. Strong grade consideration is also given to students who present work at conferences.

**Peer Interaction**

It is important that students work well with other students. If you are mentoring other students, this is a bonus.