

ON THE AWARDING OF DEPARTMENTAL HONORS 2004-2005

<http://www.haverford.edu/chem/dept/Links/DeptResources.html>.

Principles

No undergraduate curriculum is complete unless it gives students the opportunity to participate in the characteristic activity of the discipline. For Chemistry this is the advanced laboratory experience of Superlab and typically research. Such participation involves contributing to the formulation, analysis, and solution of scientific problems, and the development of these skills represents the principle around which the curriculum is organized. While this development begins in the elementary laboratories, it accelerates markedly in the junior laboratory course, underlies the advanced topics courses, but receives its fullest expression in the research courses and the accompanying departmental seminar in the senior year. Given the importance of the senior courses to our educational goals, it is only fitting that they play an important role in decisions about the awarding of honors. *Therefore senior research is required for departmental honors.* It follows also from the principles outlined here that a high average in course work in and of itself is no guarantee of departmental honors.

Certainly the major responsibility for a student's development falls to the research supervisor. It is the supervisor who watches day-to-day progress, holds regular conferences with students, and is the main source of feedback. However, all members of the department recognize a responsibility to foster every student's development. Indeed, one of the reasons for the establishment of the senior seminar was to provide a forum for the exercise of this collective responsibility. Just as the responsibility for each student's development is shared, so also is the responsibility for the decision as to whether or not to award honors, and the distinction of High Honors or Honors. These are collective decisions of the department arrived at through Haverford's usual consensus process. In contrast, the awarding of a grade in a research course, as in any other course, is the prerogative of the instructor.

Frequently-asked Questions

I intend to put as much time into my research as I do into an average course. Is this enough?

Probably not. In order to get anywhere in research you probably have to put in more time than you do in an ordinary course.

I am willing to put in more time than I do in the average course. Will putting in this time in and of itself qualify me for Honors?

No. Putting in the time is necessary for making progress, but is not in and of itself sufficient.

What are you looking for then?

We are looking for several things:

- Familiarity with the context of your work. Why is it being done? What related work can be found in the literature?

- Understanding of the techniques used to attack your problem. Why these particular techniques? What are their limitations? What kind of information will they give you?
- Critical ability. What is sound and what is weak in your own work and in the literature?
- Problem solving. Have you solved a problem that came up in your work on your own?
- Ideas. Have you come up with an idea for an experiment, or for the interpretation of an experiment?
- Some progress. This does not mean that your experiments must work. It is often just as important to know what doesn't work *and why*.

This seems like a tall order.

It is a tall order, but you all have met tall orders in the past. Your willingness to stretch yourself is the reason that you have developed the way that you have.

Do I have to contribute in all of these areas?

We do expect contributions in all of these areas for High Honors. For Honors you should have made a contribution in most of them.

If I carry my work to the stage where it can be presented at a meeting or as part of a paper prepared for publication shouldn't that qualify me for Honors?

It will be a definite plus since this is one of the surest signs of progress. In addition you will be meeting one of the important responsibilities of anyone engaged in research, that of entering into dialogue with the larger scientific community. Talks, posters at meetings, and papers are the common ways of doing this. They are part of the research process, a source of satisfaction to the researcher, and can be an important element in your education. However, as we have said already, progress in the research problem is only one of our criteria for honors.

Is it fair to give weight to presentation and publication? After all, some research problems are more tractable than others.

It would be unfair if we required it for Honors. All we are saying is that publication provides clear evidence of progress. We do recognize that research is, by its very nature, unpredictable, that some research problems are more intractable than others, and that publication or presentation are not the only evidence for progress.

You mentioned the seminar. What is its role in this process?

The seminar gives you several types of opportunities. The first is experience in presenting your own work. The second is the chance to learn through questions raised by the faculty and by your peers which areas of your presentation are strong, which are weak, which are clear, which need clarification. The third is the opportunity to interact with your peers when they present their work and so to contribute to their development. There are two presentations involved. Your first presentation in the fall semester generally provides the background to your project, *i.e.* an introduction to the problem and how you plan to approach it. If you have some data from summer research you may present it at this talk, but that is not expected. In effect this fall talk should be a research proposal. Your second presentation, in the spring semester, should present

research data or research progress, and conclusions you may reach, if possible. We understand that students presenting in the early spring may have less data to report than those reporting near the end of the semester. In assessing Honors possibilities the faculty will pay by far the greatest attention to your improvement as the program progresses. Finally, as indicated by the third category above, some weight will be given to the contribution you make to the development of your peers. Meeting your responsibility here will require your *active* participation in the seminar. Your seminar grade is not dependant on your research grade or Honors consideration. It is based on the quality of your two talks as well as your active participation in the seminar program. To receive a grade of 4.0 in seminar, you must engage in scientific dialogue with the speakers and the rest of the audience by making useful comments and asking frequent and thoughtful questions about aspects of the presentations that you don't understand. The less extensive your participation in this manner, the lower your seminar grade will be, regardless of the quality of your research presentations.

Where does my senior research thesis come into this process?

Your research paper is very important. It is the final summation of your work. It will be read by at least one faculty member in addition to your research supervisor. Should there be a question about degree of Honors, additional members of the department may read it as well in order to reach a decision. So that there is enough time for these readings, it is essential that your paper be submitted by the deadline set by the Department. You should expect this date to be close to the start of the examination period at the end of the Spring semester.

The research course represents only about 10% of my work in the department. Will my overall record be given any consideration in the Honors decision?

It certainly will, although the major consideration will be your work in research but also includes all of your coursework in chemistry, with an emphasis on the final three years. After all, the Honors assessment involves an evaluation of your development in chemistry. For example, a student with a low chemistry GPA who has done a good job in research may not get honors, but will get a good grade for the research course. There is no doubt that the grade record will also have particular weight in close decisions about students who are at the boundary between two Honors categories on the basis of the department's assessment using the criteria outlined above.

A Final Note

We have linked research and honors because our whole curriculum is designed to develop a student's ability to begin to function analytically, critically, and with some independence. The research project is not only the final opportunity to develop these traits, but it is also the best one. However, more important than the question of Honors is your growth through participation in research and your satisfaction with the experience. These represent the lasting values of your Chemistry education at Haverford.