

BIOG 2990/499 **Suggested Guidelines**

Cornell University has a large and talented undergraduate student body. Under the aegis of a course for undergraduate research in Biology, BIOG 2990 and BIOG 4990, students can participate in laboratory research or special projects including library research or computational analyses. Approximately 300 students receive credit each semester, and it has proven to be a very rewarding experience, both for the student and the faculty member. Indeed, Cornell's undergraduate research program in Biology is nationally acclaimed.

The following is a set of guidelines primarily intended for faculty members in the biological sciences who may not have had any first hand experience with training undergraduates enrolled in these classes. They represent the efforts of the Division Curriculum Committee of 1998-1999 (chaired by Prof. Ross MacIntyre), the Director of Undergraduate Studies, Prof. Jeff Doyle, and Laurel Southard, who manages the undergraduate research program and the Hughes Scholar Programs at Cornell.

Undergraduate Biology Research Classes

BIOG 2990

This course is intended for students who are new to undergraduate research. Students enrolled in BIOG 2990 may be reading scientific literature, learning research techniques or assisting with ongoing research. Credit hours are variable (Maximum of 3 credits is suggested) and grading is S/U only. The faculty supervisor will determine the work goals and the form of the final report.

BIOG 4990

Prerequisite: 1 semester of BIOG 2990 or equivalent. This course is for students continuing their Cornell research. Students enrolled for this credit should be doing independent work on their own project. The faculty supervisor will determine the form of the final report. Students must register in the Office of Undergraduate Biology in 216 Stimson Hall. Applications are available in the OUB and on the web at www.biology.cornell.edu. Each student must submit a proposed research project description during course registration. Any Cornell faculty member whose research field is biological in nature may serve as a supervisor for this course. The faculty supervisor will determine the work goals and the form of the final report. Non-Cornell supervisors are not acceptable. S/U grades optional.

1. How should credit hours be determined?

In general according to college guidelines, students should receive one credit for every three to five hours of research per week. We recognize that research is and should be "open-ended", but the student must balance his/her efforts with the demands of other courses. It is also clear that the number of hours spent at research may vary from week to week depending upon a variety of factors. Nevertheless, a minimum of three hours work per credit per week, on the average, should be expected of the student. The majority of students enrolled in BIOG 4990 receive 3 or 4 credits.

2. Should there be a formal requirement such as a final report?

This is up to the individual student and the faculty mentor, but the expectations of the latter should be made clear to the student at the beginning of the semester and indicated on the enrollment form. It may be useful in most cases for the faculty member to require a final report, or if the student will continue on the research project in the subsequent semester(s), a progress report. These may be in a written or oral format.

3. How many times may BIOG 4990 be taken for credit, or for how many total credits may it be taken?

This will again depend upon the student, *i.e.* in what year is he/she beginning the research, the open-endedness of the project and the willingness of the faculty member to continue the supervision.

The two colleges have maximum limits for credit for undergraduate research. Students in the Arts College are allowed to enroll for a maximum of 6 credits per semester with one professor and 8 with more than one. There is no credit limit in the Arts College. In CALS, a total of 15 credit hours may count towards graduation.

Up to three credits of research may be used to complete the Programs of Study in General Biology, Genetics and Development, and Systematics and Biotic Diversity, and four credits of research in Neurobiology and Behavior. In order to count for the program of study, BIOG 4990 must be taken for a letter grade.

4. Can BIOG 4990 be taken S/U?

Yes, once again the faculty member and the student should decide this. BIOG 2990, which must be taken the first semester that a student is involved in research, is S/U only. This guideline recognizes that research, done for the first time represents a trial period. We also recommend that students only register for 2 credits of BIOG 2990, again to make sure he/she has the time to adjust to the research environment.

5. Which course is for students working on projects not involving independent or quasi-independent research?

Students performing service functions that would normally be performed by a paid position should not receive academic credit for this work. BIOG 2990, is a course for students working on a professor's research doing routine laboratory work, assisting another lab member, learning techniques, or doing a course of directed readings. In general, BIOG 4990 projects are developed by the student and faculty interacting to design experiments. We anticipate that in most cases that BIOG 2990 be a course for freshmen and sophomores, and juniors and seniors will enroll in BIOG 4990.

6. Who can sponsor BIOG 2990 and 499?

In both cases, a faculty member must be responsible for the student and the grade the student earns. The research that the student is doing must be biological in nature. Otherwise, any faculty member in a department participating in the major is eligible, as is any faculty member in a graduate field encompassing a biological science. Supervisors outside of Cornell are not allowed.

Students will not be allowed to register for BIOG 2990 or 499 with a graduate student or a post-doc. Individual departments will decide their policy on allowing research associates and lecturers to sponsor undergraduate researchers.