



Request to Apply for Biology 390 Independent Study

Please note: You must include an “unofficial” copy of your transcripts with this application.

List your biology course(s) that are in progress.

List your chemistry course(s) that are in progress.

Do you have laboratory experience other than that associated with courses? If so, describe briefly.

Normally, independent study involves a laboratory research project. What aspect(s) of laboratory work appeals to you most?

Do you have any moral or ethical objections to the use, within federal and state guidelines, of living animal models (e.g., mice) for biomedical research? ____ If yes, explain briefly.

What do you see as the long-term benefit of the research project to you?

Please return this form to the Supervising Instructor or to the Department Chairperson



Guidelines Regarding Student Participation in a Biology 390 Independent Study Course (laboratory or field-based research format)

Independent Study Projects

Calvin College provides an opportunity for students to do independent research or reading when they have demonstrated their competence in the academic discipline(s) involved and have shown an ability to study on their own initiative. An independent study must include substantial research and/or reading in an area not covered in a regular course offering of the Biology Department.

The Biology 390 course is an opportunity for a student to conduct an independent research project under the guidance of a Biology Department faculty member. Projects for such study must be defined in advance of registration and must be approved by the instructor directing the study, the departmental chairperson, and the Registrar. Each course must be completed within the term. Because independent study projects require considerable time of the instructor as well as the student, an instructor is not obligated to approve an independent study and is expected to limit the number of students accepted.

Eligibility for an Independent Study Project

To be eligible for an independent study, a student must have completed four courses in biology and must have an overall GPA of at least 3.3 in those courses. An independent study shall carry credit of either 2 or 4 semester hours. No more than 4 semester hours of such study may be applied toward a biology major and no more than 8 semester hours of such study may be applied toward graduation requirements.

Expectations of Student Participating in Independent Study

To maximize the benefit of an independent study project to a student, the Biology Department requires that the following items be included in a course:

1. Preparation. For a project to have significance, it must be well-conceived and tied to the existing knowledge in the field. To assure that a project has such a basis, the student is required to complete:
 - a. a bibliography (a listing of a body of literature appropriate to the project). As an option, a student may be required to complete an annotated bibliography, i.e., a bibliography accompanied by a brief paragraph for each entry indicating the significance of the item. A bibliography may also include a report of the sources searched. The bibliography may be submitted at the end of the semester.
 - b. a project proposal. The proposal should be prepared in rough form for the initial course proposal, but should be prepared in detail at the beginning of the semester in consultation with the supervising faculty member and the literature. A rough project proposal must be completed before the project is undertaken.
2. Project. The heart of any scientific study is the data collected. Securing useful data entails appropriate experiment design, careful data collection and regular recording and review of work in progress. To assure that adequate and appropriate data are collected, the following items will be an ongoing part of the project:
 - a. a log of work done on the project, i.e., a laboratory and/or field notebook in which records, dates, times, places, experimental conditions, and data are kept.
 - b. a weekly progress review, i.e., a meeting with the supervising faculty member to review work done in the past week and the work planned for the following week. The log should be clearly labeled and kept up-to-date so that data, sites visited, experimental techniques, data analyses, etc. can be reviewed at the weekly progress sessions. The log will be submitted with the final project report.

- Report. The proper end of a research project is a report on the study and its findings. The report may be a formal paper or a poster presentation. A written report will include the usual components of a scientific paper (title, abstract, introduction, methods and materials, results, discussion, literature cited as well as supporting tables and figures). The style for citations, figures, tables, etc. in the paper will be that of a major journal in the disciplinary area of the study. A written report is required of students taking Biology 390 for Honors credit.

Instead of, or in addition to the written report, a student may be required to present the study in poster form. The style of the poster will be that which is common to the particular disciplinary area involved in the study and will be arranged in consultation with the supervising faculty member. A student applying for investigations exemption on the basis of his or her Biology 390 experience will present a seminar, paper or poster as the final report of the result of that study.

Students will also be encouraged, but not required, to present a seminar to the Biology Department students and staff if the study and data are appropriate.