

**BIO 395/396/495/496**  
**Research Learning Agreement and Syllabus**  
**3 Credits, Pass/Fail**



Course Goals and Learning Outcomes:

Research taken for credit is an intensive experience course undertaken by students under the direction of and in collaboration with a faculty member. While undertaking research in a faculty member's laboratory, students will perform experiments, analyze data, help design experiments, and help decide which subsequent experiments are appropriate to perform. In performing research, students will: 1) develop their critical thinking skills, 2) develop their ability to synthesize information from a variety of disciplines, 3) conceptualize, initiate, execute and review research protocols to derive new and original information, 4) learn to keep a scientific notebook, and 5) work toward being a scholar in a particular discipline. As appropriate, students will consult primary scientific literature to guide their experimentation. In addition, students will communicate the results of their work using professional standards in publication of a technical paper and/or formal presentation of their research results, such as an oral presentation or a poster presentation.

Curricular Requirements Fulfilled by the Course:

Research can be fulfill a one - 3 credit BIO Elective (Without Lab) requirement or Free Elective. While more than one semester of Research is allowed, only 3 credits from either Research (OR Internship - BIO 450) will be considered toward a Biology Elective – all others will be considered Free Electives.

Time: Schedule to be arranged with individual Instructor

Office Hours:

As this is a research course, students and faculty members will meet and coordinate their efforts multiple times per week. Additional meetings will be scheduled as needed.

Course Text and Primary Scientific Literature:

There is no textbook for this course. Written resources for the course will be consulted as appropriate to the student's project. These include, but are not limited to, primary scientific literature, established laboratory protocols, and various technical manuals detailing use of equipment or experimental protocols.

Course Grading Standards:

This course is graded on a Pass/Fail basis. To earn a mark of "Pass", a student must be present in the laboratory or field for the required number of hours, be attentive to their learning and research project, and make steady forward progress. Both research progress and student learning progress will be regularly discussed with the faculty mentor.

### Course Schedule, Participation, and Attendance:

As this is a 3 credit course, students are expected to participate for an average of 9 hours - or more – with a minimum of 6 hours/week in lab with the remainder outside lab synthesizing what they have learned, planning experiments, reading scientific literature, analyzing data, etc. Students and faculty will discuss and mutually agree upon the days and times the student will work in the laboratory and/or field. The research project will be conducted in close consultation with the faculty advisor.

### Laboratory Safety:

At the beginning of working in the laboratory, students are required to complete the College's online Chemical Safety Training Program and any other biosafety training appropriate for their specific laboratory and working environment. It is the responsibility of the faculty member to apprise students of hazards they may encounter in their work and to provide hazard-specific training and personal protective equipment as needed. Upon activation of the building fire alarm, all occupants must exit to a position safely away from the building. Those who require assistance during an emergency should contact the instructor so that arrangements can be made in advance. Students must become familiar with the locations of emergency exits.

### Scientific and Academic Integrity:

As scientists in training, students are expected to learn to perform their research in an ethical manner and with the highest level of integrity. This means that students will perform their research objectively using appropriate techniques and without predetermined outcomes. In addition, students are expected to accurately record and represent their data. When appropriate, students should properly acknowledge the intellectual contributions of others.

### Students with Special Needs:

Students with special needs (i.e. learning, attention, or physical disabilities) who need specific accommodations are encouraged to work with both the Office of Academic Services (OAS) and the instructor to arrange appropriate accommodations. The OAS is located on the upper level of the Philips Memorial Library, offers a wide variety of support services for all PC students, including group and individual tutoring, academic skills mentoring, disability support, and writing assistance.

### Inclusivity Statement:

Providence College seeks to ensure that diversity, in its many forms, is considered in every aspect of campus life by making diversity a factor in, and component of, all decision-making, and resolving to increase and retain the diversity, in its many forms, on campus.