

Independent/Directed Study for Undergraduates

Scientific research usually involves a question, an investigation of that question, and finally, communication of the discovery. Most often, scientific investigations involve literature searches, and designing and performing experiments. The experience of working in a research group is an important part of learning and understanding the agricultural and life sciences. Undergraduates are encouraged to gain independent research experience or obtain positions as hourly workers in research groups in their area of interest. Students typically work in a research group for credit (see your mentor for course number and appropriate number of credits) or an hourly wage.

In the Department of Biomolecular Chemistry, undergraduate research is defined as self-directed work under the supervision and guidance of an Instructor (see definition below) and often in conjunction with a day-to-day mentor that is a graduate student or postdoc researcher in the Instructor's group. Students normally participate in aspects of ongoing research projects. Attempts are made to match student interests with specific research projects.

Students who become involved in research:

- Apply concepts learned in coursework to real life situations;
- Learn to read and effectively search scientific literature;
- Develop critical, analytical, and independent thinking skills;
- Increase their scientific confidence;
- Discover career interests;
- Learn about current issues, methods, and leaders in the field;
- Work closely with a faculty mentor;
- Explore and prepare for future careers;
- Develop marketable skills;
- Enhance professional communication skills;
- Experience the excitement of discovery;
- Prepare for graduate or professional programs;
- Develop networking relationships with students, professors, and other scientific professionals within your research group, department, campus, country, and even around the world;
- Fulfill graduation requirements

Requirements:

Instructors: According to UW policy, a directed study instructor must hold at least UW-Madison instructor appointment. Biomolecular Chemistry Dept. will limit this role to tenured/tenure track faculty. This list includes: (See Appendix A)

Enrollment: It is up to the individual student to initiate and develop arrangements with the instructor. Students make the request to the instructor, who may accept or decline. Arrangements should be made by the **Course Add Deadline—usually the second week for fall and spring semesters**. Students who enroll late will need instructor, departmental chair and academic dean approval.

Plan of Study: Students are responsible for preparing an individual plan of study, in consultation with the instructor or designee of the instructor, usually a graduate student mentor or post doc mentor. Within the study plan, hourly expectations, research plan, and evaluation of the research will be documented by completing the form below. Both student and instructor should keep a copy of this document.

Credit Hours: According to the Federal Credit Definition, the amount of credit for regular *group* instruction is such that each credit should be equivalent to one hour of classroom instruction and a

minimum of two hours of additional student work per week over 15 weeks, or the equivalent effort over a different time frame, or an amount of academic work equivalent to what would be expected in other for-credit activity. **(Please see policy, Section F, for further clarification)** Credit levels require judgment of the instructor. Credit levels must be justified in the plan of study and be consistent with the standards of the discipline. The Department of Biomolecular Chemistry recommends that students be prepared to spend at least 10 hours/week in the laboratory. Ten hours would equate to a 2-3 credit independent study, but will require the judgment of the instructor and factoring in the nature of the work.

Registration of independent study: For any questions regarding registering students for independent study, please contact the BMC Department: Elyse Meuer (265-1492), 1135H Biochemistry Building, 420 Henry Mall. Email: eemeuer@wisc.edu.

Limits on Enrollment for instructors: The limit will be set to 40 student credit hours of undergraduate instruction in directed study per instructor per semester.

BioSafety Training: Safety training is required for all who work in the laboratory setting. At a minimum, the undergraduate student will complete the following Online Biosafety Training classes:

Biosafety 101: Risk Assessment

Biosafety 102: Blood borne Pathogens (Check with your Instructor if needed)

Biosafety 104: Safe Use of Sharps

Biosafety 201: NIH Guidelines

These classes are found at <http://www.ehs.wisc.edu/biosafetytraining.htm>

Chemical Safety Training: Chemical Safety Training is encouraged for all who work in a laboratory setting where chemicals are used. This training is an in-person class. To register please visit: <http://www.ehs.wisc.edu/chemsafetytraining.htm>

Evaluation of undergraduate research:

- Re-occurring meetings (one to one or spontaneous) throughout semester with undergrad and instructor. Once per 3 weeks is recommended.
- Maintenance of laboratory notebook
- Completed Final Evaluation Form

Along with one of the following at the end of the semester:

- Poster presentation
- Power point presentation
- Written report/thesis

Undergraduate Orientation

1. Meet with Instructor and graduate student/post doc mentor to discuss requirements and expectations of undergraduate research
 - a. Discuss expectations of the undergraduate research experience
 - b. Discuss best way to communicate with mentor/instructor
 - c. Hourly requirements clearly stated
 - d. Credit hours discussed
 - e. Research Plan
 - f. Options for final assessment and presentation of research at end of semester
 - g. Submit form on website

2. Lab and building policies and procedures (instructor)
 - a. Orientation to building, restrooms, and lab
 - b. Access to building (need WISCard ID number and email address)
 - c. Safety Training Registration
 - d. Dress Code
 - e. Emergency Procedures—Chemical Spill, Eye Washes, Emergency Showers,
Building Evacuation

3. Contact Elyse Meuer, BMC Senior Student Services Coordinator, to register for correct class (261-1492).

Appendix A

BMC Faculty

Jon Audhya

David Brow

Josh Coon

Gheorghe Craciun

James Dahlberg

John Denu

Feyza Engin

Robert Fillingame

Catherine Fox

Melissa Harrison

Christina Hull

James Keck

Tricia Kiley

Peter Lewis

Deane Mosher

Michael Sheets

**FINAL EVALUATION
UNDERGRADUATE RESEARCH INDEPENDENT STUDY**

Student Name: _____

Instructor Name: _____

Course Number: _____

Credit Hours Assigned: _____

FINAL EVALUATION CHECKLIST

- Undergraduate Research Contract
- Biosafety Training Complete
- Chemical Safety Training Complete (optional)
- Laboratory Notebook
- Final Project Presentation
 - Poster
 - Power Point Presentation
 - Written Report/Thesis

Evaluation/Comments:

Instructor Signature

Date