



## Chemistry & Biochemistry Directed Research and Independent Study Proposal Form

Student Name \_\_\_\_\_ Student ID \_\_\_\_\_  
 Student Phone Number \_\_\_\_\_ Student UA Email \_\_\_\_\_

Class  Freshman  Sophomore  Junior  Senior Major \_\_\_\_\_  
 CHEM or Directed Research (graded)  392  492  
 BIOC Independent Study (P/F)  299  499  
 Honors Independent Study (graded)  299H  499H

- Enrollment in CHEM/BIOC 492, 499 or 499H requires completion of Organic Chemistry I and II.
- Most students should sign up for Directed Research; Independent Study mostly refers to non-lab work.

Course Section (if known) \_\_\_\_\_  
 Number of Units \_\_\_\_\_ Semester \_\_\_\_\_ Year \_\_\_\_\_ Grad. Date? \_\_\_\_\_

Project Research Mentor \_\_\_\_\_ Research Mentor Dept. \_\_\_\_\_

Research Mentor UA Email \_\_\_\_\_ Research Mentor Phone Number \_\_\_\_\_

Title of Project \_\_\_\_\_

Estimated hours per week Student will spend on project \_\_\_\_\_

Estimated Research Mentor /Student contact hours per week \_\_\_\_\_

Date(s) for mid-semester evaluation of student performance \_\_\_\_\_

At least one mid-semester evaluation should be completed before the second drop deadline. If appropriate, provide the name of another person with a supervisory role: \_\_\_\_\_ email: \_\_\_\_\_

### INTENDED LEARNING OUTCOMES

There are many tangible benefits to participating in a directed research experience as an undergraduate student. Joining a research lab allows students to move beyond the traditional classroom environment into an atmosphere of discovery, collaboration and focus on projects with broad impacts to the modern world. Undergraduate research provides the opportunity:

- to integrate and strengthen comprehension of chemical principles
- to develop scientific and professional skills
- to gain a greater understanding of scientific inquiry and to contribute to the generation of new scientific knowledge
- to facilitate the formation of a mentor/mentee relationship between the faculty advisor and the student

Projects should be well-defined, have a high likelihood of completion during the undergraduate career of the student, use a variety of instrumentation or scientific techniques, promote awareness of safety practices and improve familiarity with scientific literature.

*Additionally, courses with graded units require a comprehensive report at the end of each semester.* With these requirements in mind, provide a brief description of the planned activities for the semester, include those that are amenable to evaluation for grading purposes.

**Description of research project:** (if necessary, continue on the back of the page or attach a separate project plan)

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Will the student be expected to attend and participate in lab meetings? Yes No

Will the student maintain a lab notebook? Yes No

Lab techniques the student intends to learn and utilize as part of this research project:

\_\_\_\_\_  
 \_\_\_\_\_

**How will the student summarize the research performed?** (e.g., written summary, poster presentation, oral presentation) Provide specific details (e.g., 10 page literature review).

\_\_\_\_\_  
 \_\_\_\_\_

**SCHEDULING OF INDEPENDENT STUDY OR DIRECTED RESEARCH**

Before meeting with a potential project advisor, students should print out their semester schedule in graphical format from Student Link and highlight the possible time blocks available per week for directed research. Each unit of credit translates to three hours per week dedicated to research. For example, three units translate to approximately nine hours per week throughout the semester for a total of 135 hours. With the project advisor, identify which blocks of time will be used to fulfill the time requirement. Attach the highlighted schedule to this form, initialed by the project advisor.

**LABORATORY SAFETY TRAINING** \*\* Successful completion of the UA online laboratory safety course is a requirement.

The course can be found at: <https://d2l.arizona.edu/> by logging in using your UA NetID and password. Click on "Self Registration" in the blue navigation bar on the top left. Look through the list of courses offered and click on the link to "Laboratory Chemical Safety." Prior completion of CHEM 405 Chemical Safety with a passing grade will also satisfy this requirement.

**Responsible Conduct of Research Workshop/Certificate (RCR)** \*\* RCR undergraduate certificate completion required. You must complete either the in-person "Research: Introduction to the Responsible Conduct of Research" workshop or the "Research: Online CITI RCR Training" module. Follow the directions found at <http://rgw.arizona.edu/research-compliance/rcr/certificate-program#undergraduateRCR> to register and complete requirements.

**\*\*Attach your completed class schedule, lab safety results and RCR results to this form**

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These courses 492, 499(h) are Engaged Learning courses in which you will participate in significant experiential learning and reflection designed to prepare you to apply skills and knowledge to the types of problems you may encounter beyond the classroom. If you earn a grade of C or better [in the case of courses with an alternative grade, P or better], you will earn the notation "Engaged Learning Experience: Completed" on your UA transcript. The completion of this course will also appear on your Student Engagement Record in UAccess (available late Fall 2015).

The course has been designated with the following Engaged Learning attributes:  
Engagement Activity: Discovery  
Engagement Competency: Innovation & Creativity

The University policy on Engaged Learning is available at [http://catalog.arizona.edu/2015-16/policies/engagemt\\_guidelns.htm](http://catalog.arizona.edu/2015-16/policies/engagemt_guidelns.htm)  
For more information on Engaged Learning, you may also visit <http://ose.arizona.edu/100-engagement>

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**\*\*Departmental deadline for submission is on the first day of classes of each semester.**

**REQUIRED SIGNATURES**

STUDENT \_\_\_\_\_ DATE \_\_\_\_\_

**FOR PROJECT ADVISOR USE**

The student's grade for this course is based upon the level to which they meet the criteria listed in the description of the project and the intended learning outcomes.

Research Mentor \_\_\_\_\_ DATE \_\_\_\_\_

**FOR BIOCHEMISTRY MAJORS USE**

BIOCHEMISTRY FACULTY ADVISOR \_\_\_\_\_ DATE \_\_\_\_\_

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**Return completed contracts to the CBC Advising Office in Old Chemistry Room 210a.** This form is for department records and is used to assign a grade at the end of the semester. All adjustments to the form must be made in person and initialed before any enrollment changes can be completed. Questions? Contact Olivia Mendoza (omendoza@email.arizona.edu or 520.621.3868).