

S24 Research for Credit (03-445): Student Requirements

Keep this page for your reference & review this with your research advisor
 Research for Credit (03-445) allows you to obtain course credits for doing a research project.
This course includes the following requirements and expectations; you must:

Schedule time

Identify **two time blocks** during the week between 9AM to 5PM during which you could work on your project. (For example, 6 total units for the semester = 6 hours per week = two 3 hour time blocks.) Once you gain independence, you may choose to work more flexible hours with the agreement of your faculty research advisor.

You must spend at least **one hour of work weekly per registered credit hour**. This can consist of in-lab work, computer coding, literature review, data analysis, report writing, etc. The composition of your time depends on the nature of your project and should be agreed on with your research advisor prior to starting.

Attend your meetings

You may be expected to attend all **lab meetings and journal clubs** that the lab may have. Please contact your research advisor for more information.

Research for Credit requires dedication from you and your research advisor. During busy times it is **not** permissible for you to skip work to study for exams or write papers.

Communicate with your research advisor

Work with your research advisor to go over what they expect of you this semester. How frequently would they like you to check-in with them? What are their deadlines for you to submit your work for grading or review? What should your work week consist of?

Complete your report

You must submit a report at the end of the semester; **reports may not be co-written. The report must be approved (signed) by your faculty research advisor before final submission:**

The signed report must be submitted by 5:00pm on Reading Day (Wednesday, May 1) to the Undergraduate Programs office (bio-ungrad@andrew.cmu.edu).

Be sure to submit the report to your research advisor with enough time for them to review and sign it. It is **your** responsibility to ensure it is sent (signed) to the Undergraduate Programs office by the deadline. **Please plan ahead with your advisor**, and consider any additional time you may need to receive and incorporate feedback they may provide.

Report requirements:

Your report must be **1.5 to 2 pages** (around 1000 words) in length, and it **must address the following components:**

Rationale – Why is your work important? What scientific question did your work address?

Approach – What techniques did you use to address your scientific question? Why?

Results – Describe your outcomes. What did you find?

Setbacks – Describe any problems that you encountered. What did you learn?

Conclusions – What do your outcomes tell you? How does this fit into the “big picture?”

Prospects for the future – Should you pursue the project, modify it, extend it?

Reminder: Reports may not be co-written. While research projects are often a collaborative effort, reports should be written individually to demonstrate a personal understanding of each of these six components.

By signing the Registration Request Form, the student acknowledges and agrees to these requirements and the associated deadlines.

S24 Research for Credit: Research Advisor Requirements

This page is to be reviewed by the faculty research advisor

_____ is requesting permission to register for Biological Sciences Research for Credit (03-445) at Carnegie Mellon University. You, the faculty research advisor, must approve this student earning credit for their work in your lab this semester. **Your responsibilities will include:**

Providing an appropriate mentor for the student

Please identify and coordinate with a research mentor for the student. This could be you, but it could also include a postdoc, experienced technician, or senior graduate student in the lab.

Confirming that the student has the appropriate safety training from CMU Environmental Health and Safety as appropriate

If a student has taken 09-207 (Techniques in Quantitative Analysis) or 09-221 (Laboratory I: Introduction to Chemical Analysis), then they received CMU's general lab safety training. If your lab requires more extensive safety training or if your lab is not on CMU's campus, then the student will need to complete that safety training before they can begin their research.

Submitting mid-semester and final grades.

The Undergraduate Programs office (bio-ungrad@andrew.cmu.edu) will contact you for the mid-semester grade and the final grade. Reminders will be sent closer to the due dates:

Mid-Semester Grade, due by 4:00 pm on Friday, March 8

Final Grade, due by 4:00 pm on Monday, May 6

You should discuss your expectations with the student early in the semester; please review the Student Requirements page together for more details.

Because project outcomes are not guaranteed, we ask that grades be considered on the following items:

- The number of hours per week the student is engaged in the lab; this should be equal to the number of hours listed in "units" on the registration request form.
- Was the student intellectually engaged in their project?
- Did the student keep an accurate and up-to-date lab notebook? Did they communicate effectively with you and their immediate supervisor?
- Was the student's final report accurate and well written?

Reviewing and approving a final summary of the student's work

Students will be required to submit a summary of their work in the form of a written report.

Reports may not be co-written.

It is preferred that the report is less than 2 pages, but figures and references may exceed that text limit. The final format of the document is up to you, but the report should address:

- **Rationale** – Why is the work important? What scientific question did it address?
- **Approach** – What techniques were used to address your scientific question? Why?
- **Results** – Describe the outcomes. What were the findings of the research?
- **Setbacks** – Describe any problems encountered. What was learned from them?
- **Conclusions** – What do the outcomes mean? How does this fit into the “big picture?”
- **Prospects for the future** – Should the student pursue the project, modify it, extend it?

You will need to sign (either physically or electronically) a final copy of the report before the student can submit it; it is the student's responsibility to ensure the final, signed report is sent to the Undergraduate Programs office (bio-ungrad@andrew.cmu.edu). The student should be in touch with you in advance to ensure that they get the required signature by the deadline.

By signing the Registration Request Form, the student acknowledges and agrees to these requirements and the associated deadlines.

Research for credit (03-445): Checklist & Quick-Reference:

(Optional, but recommended to complete this for your own records)

Project title: _____

Faculty mentor: _____

Identified weekly time blocks equal to the number of credits taken for this course (1 credit = 1 hour)

Those time blocks are: _____

My research advisor approved the time blocks

Set a deadline with my mentor for receiving my report draft for initial review. I will send my draft to my mentor by: _____

Set a deadline with my mentor for receiving my *final* report. I will send it to my mentor by _____ so that they can send it back to me, signed, in time for me to submit to the Undergraduate

Programs office by the last deadline.

Finished first draft of the end-of-semester report

Sent the report draft to my mentor for review

Received report feedback from my mentor

Incorporated any revisions into the report

Submitted my final end-of-the-semester report to my mentor for review

Received my approved/signed report back from my mentor

Sent the signed report to bio-ungrad@andrew.cmu.edu by the deadline: _____

Important contact information & notes:

Biological Sciences Research for Credit (03-445): Registration Request Form for Spring 2024

This signed form is due back to the Undergraduate Programs Office (bio-ungrad@andrew.cmu.edu) by 9:00AM Friday, January 26.

Forms submitted after this date will be accepted only on a case-by-case basis.

Student name: _____ Andrew ID: _____

Research Advisor's name: _____

Research Advisor's affiliation (i.e., CMU, Pitt, etc.) _____

Research Advisor's e-mail address: _____

Research Advisor's phone number: _____

Number of units* to be registered (max: 10) _____ Semester: **Spring 2024**

**Each unit is equivalent to 1 hour of research/work per week*

Project Title: _____

Please summarize the work you will be doing for this project in the space below:

CMU-Based Projects

By signing this form, the student named above ("Student") is choosing to participate in the project described above ("Project") as a Biological Sciences Research for Credit. In consideration of the opportunity to participate in the Project as a Biological Sciences Research for Credit, Student agrees that Carnegie Mellon University will own (and student hereby irrevocably assigns and transfers to Carnegie Mellon) any and all right, title and interest (including intellectual property rights) Student may have in the work performed by Student on the Project. Student agrees to execute any paperwork reasonably requested by Carnegie Mellon to confirm this assignment and/or the nature of any work developed by Student. Student agrees that Carnegie Mellon may exercise all ownership rights in the assigned Project work (including but not limited to the right to disseminate it to others) even though such Project work may constitute an educational record within the meaning of the Family Educational Rights and Privacy Act of 1974 (FERPA). Although Carnegie Mellon will own the Project work, Student may continue to use the general experience, know-how and techniques learned by Student under the Project for non-commercial educational and research purposes. Student may also mention this Project experience on Student's resume or portfolio. Student's participation in this research for credit Project is unpaid and intended to provide an educational experience for Student. Student is not entitled to any university employment, financial compensation or university benefits as a result of Student's participation in the Project and/or development of work under it.

Student should sign this form only if Student is at least 18 years old and is willing and able to participate in this research for credit Project under the terms described in this form. If Student is not at least 18, or if Student is not in agreement with the Project or terms listed in this form, the Student should contact Student's advisor to discuss alternate ways to fulfill Student's credit requirements.

SIGNATURES BELOW CONFIRM ACKNOWLEDGEMENT OF STUDENT AND RESEARCH ADVISOR REQUIREMENTS ON THE PREVIOUS PAGES.

Intending to be legally bound under Pennsylvania law, this form is signed in favor of, and for the benefit of, Carnegie Mellon University.

Student Signature _____ Date _____

Research Advisor's Signature _____ Date _____

Off-Campus Projects

SIGNATURES BELOW CONFIRM ACKNOWLEDGEMENT OF STUDENT AND RESEARCH ADVISOR REQUIREMENTS ON THE PREVIOUS PAGES.

Student Signature _____ Date _____

Research Advisor's Signature _____ Date _____