

Research in Biology Syllabus
01:119:307, 308, 406, 407

Course Time:	Hours by Arrangement
Course Coordinator:	Anne Carr-Schmid, Ph.D. Assistant Professor - Director of Undergraduate Advising, Biological Sciences
Office Location:	Nelson B112, Busch Campus
Email:	schmid@biology.rutgers.edu
Class Website	https://tlt.rutgers.edu/canvas
Pre-Requisite Courses:	119:115, 116, 117 or by special permission
Add. Requirements:	2.8 Cumulative GPA, declared Biological Sciences majors or minors
Credits:	1-4 credits permitted (each credit requires 4-5 hours per week)

Course Description: Research in Biology (119:307/308/406/407) is intended to provide students with the opportunity to experience the scientific discovery process. Students engage in laboratory and/or field experimentation under the direct supervision of a faculty mentor from Rutgers- NB. Each student is expected to carry out his/her own research project. Laboratory exposure is an essential component of this course. Students are required to complete 4-5 hours per week of research per registered credit. Students present their research in written form in a scientifically formatted 10 page paper.

Learning Goals:

By the end of the course, students are expected to be able to:

- 1) Demonstrate both factual and conceptual knowledge of the field.
- 2) Demonstrate the ability to analyze, present and interpret scientific data.
- 3) Demonstrate clear understanding and justification of their research hypothesis and the experimental methods/design and limitations.
- 4) Demonstrate ability to draw accurate and appropriate conclusions and identify implications and future directions of the research

DUE DATES AND KEY REQUIREMENTS:

I. Rough Draft of Research Paper – Due Wednesday, April 25th

A rough draft of your final paper must be submitted to:

- A) Your Research Faculty Mentor for review
- B) The *Research in Biology Course Canvas site* for our record by midnight.

II. Final Graded Research Paper- Due Wednesday May 2nd

The final, revised paper must be submitted to:

- A) The *Research in Biology Canvas site* by midnight.
- B) As a hard copy to Nelson B112 by 5 pm.

III. Completed Grading Sheet – Due Wednesday, May 2nd

The completed grading sheet with rubric must be scanned and submitted:

- A) By your Research Faculty Mentor to Dr. Carr-Schmid at schmid@biology.rutgers.edu by May 2nd.

Cover pages will not be accepted from student accounts or hand-delivered. It is your responsibility to print out the grading sheet (including rubric assessment guidelines- see FILES) and provide with your research paper for grading.

Please note: Failure to submit your paper or grade sheet in a timely fashion may impact May graduation, if the course is required to fulfill your Bio major and graduation requirements! Grades not submitted in time to meet required roster submission deadlines will be given a TF (temporary F) and will updated only once all requirements are met.

Late Papers: For an extension on the May 2nd due date, your Faculty Research Mentor must contact Dr. Carr-Schmid by email to indicate they approve the extension and provide a new expected due date. Requests for extensions should be done prior to May 2nd. Discuss this with your faculty member, to ensure they are not out of town or unavailable during this April 25th-May 2nd time frame. Faculty may take a student's failure to submit the draft or final paper on time into consideration when determining the final grades.

Research Paper grades are determined by your faculty research mentor. Issues regarding grading should first be discussed with your mentor. If a problem persists, please contact Dr. Carr-Schmid to discuss.

Research Paper Guidelines:

For many students, Research in Biology is the first time they will write a scientific paper. The format of a scientific paper is very different than for an essay or term paper. This outline below has been designed to address the basics of scientific writing. It is expected that throughout the semester the student will work closely with their advisor on the paper, who will provide guidelines most appropriate for their field of research. If you are repeating Research in Biology, you may not submit the same research paper the next semester. You may utilize previous portions (e.g. background information or specific materials and methods sections), but should be expanding upon what you previously wrote and a significant portion of the 10 pages should be new.

Construct a conservative timeline: Writing should begin early in the semester. Rough drafts of the Introduction and Materials & Methods sections are easy ones to write while you are doing the literature search on your project and beginning to learn the research techniques. The Results section can also be written early as a prediction. A final draft of the entire paper should be submitted to the research advisor one week before the final deadline for submission. The paper should include the sections described below:

Title: The title should be short, descriptive, and refer specifically to your project. Use the provided cover page format (see files)

Abstract: The Abstract is a summary of the project and emphasizes the results and conclusions. It should be very succinct- approximately 200 words in length- and briefly present the objective, experimental design, summary of results, and significance of the study.

Introduction: This section provides the purpose of the experiments performed in the project and an appropriate literature background. The hypothesis and objectives of the study should be included in the Introduction. Importantly, you should include a range of expected results from the experiment; make predictions based on the possible results of the experiment.

Material and Methods: This section should provide sufficient information to permit repetition of the study by others, but avoid unnecessary detail. All methods used in the study must be documented, however, do not copy word-for-word any of the written sources you used. Instead, you should summarize in your own words what you did.

Results: This section should contain a concise account of the new information. Once data has been analyzed, a summation should be presented. Tables, figures, graphs, pictures, etc. should be used as appropriate and include figure legends.

Discussion: The Discussion is a critical section of the paper and cannot be well-written until the rest of the paper is in good shape. It should address whether your hypothesis was supported or rejected, how the data compare to work done by others, the biological principles which explain what happened in your study, and what experiments should be done next.

Literature Cited: APA style recommended. Citations are arranged alphabetically. All references cited in the text must appear in the literature cited section, and all items in this section must be cited in the text. The formatting of the references varies among journals so select a style which is appropriate for the top journal in your field. Regardless of the format you choose, it is important to stay consistent within your paper.

General formatting: The paper must be at least 10 pages in length. Times New Roman, 12 point font, 1.5 line spacing and 1" margins are the recommended specifications, although a research supervisor is free to alter these requirements as per the standards of their lab or field. The papers must be stapled and plastic covers should not be included.

If you are having difficulties with the project, speak to your research advisor first!

If they remain unresolved, please contact Dr. Carr-Schmid

Current Academic Integrity Policy:

<http://academicintegrity.rutgers.edu/academic-integrity-policy/>

Violations include: cheating, fabrication, plagiarism, denying others access to information or material, and facilitating violations of academic integrity.

Student-Wellness Services:

Just In Case Web App

<http://codu.co/cee05e>

Access helpful mental health information and resources for yourself or a friend in a mental health crisis on your smartphone or tablet and easily contact CAPS or RUPD.

Counseling, ADAP & Psychiatric Services (CAPS)

(848) 932-7884 / 17 Senior Street, New Brunswick, NJ 08901/ www.rhscaps.rutgers.edu/

CAPS is a University mental health support service that includes counseling, alcohol and other drug assistance, and psychiatric services staffed by a team of professional within Rutgers Health services to support students' efforts to succeed at Rutgers University. CAPS offers a variety of services that include: individual therapy, group therapy and workshops, crisis intervention, referral to specialists in the community and consultation and collaboration with campus partners.

Violence Prevention & Victim Assistance (VPVA)

(848) 932-1181 / 3 Bartlett Street, New Brunswick, NJ 08901 / www.vpva.rutgers.edu/

The Office for Violence Prevention and Victim Assistance provides confidential crisis intervention, counseling and advocacy for victims of sexual and relationship violence and stalking to students, staff and faculty. To reach staff during office hours when the university is open or to reach an advocate after hours, call 848-932-1181.

Disability Services

(848) 445-6800 / Lucy Stone Hall, Suite A145, Livingston Campus, 54 Joyce Kilmer Avenue, Piscataway, NJ 08854 / <https://ods.rutgers.edu/>

Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation:

<https://ods.rutgers.edu/students/documentation-guidelines>. If the documentation supports your request for reasonable accommodations, your campus' disability services office will provide you with a Letter of Accommodations. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. To begin this process, please complete the Registration form on the ODS web site at: <https://ods.rutgers.edu/students/registration-form>.

Scarlet Listeners

(732) 247-5555 / <http://www.scarletlisteners.com/>

Free and confidential peer counseling and referral hotline, providing a comforting and supportive safe space