



SENIOR RESEARCH IN CBN SYLLABUS

COURSE TITLE: Senior research in CBN

COURSE CATALOG NUMBER: 01:146:406

SEMESTER: Spring; 1 research credit = 4-5 hours of research in lab per week

COURSE COORDINATOR AND CONTACT INFORMATION:

Dr. Shu Chan Hsu (Coordinator)

D410 Nelson Labs

Busch Campus

Hsu@biology.rutgers.edu

COURSE MEETING DAYS, TIMES, LOCATION, MODALITY:

Students doing supervised research in a Rutgers/RWJMS laboratory. 1 research credit = 4-5 hours of research in laboratory per week.

Research credit application:

Procedure: Once you have been accepted into a Rutgers/RWJMS laboratory for supervised research, email the research coordinator

1. a completed research application form from the CBN “Research for credits” site.
2. a 1- or 2-page research proposal written in coordination with your laboratory research mentor to describe your research project and your role in the research project.

Research project approval: the fulfillment of 4 criteria is necessary for research project approval

1. The research project must involve a molecule, a cell or the nervous system.
2. The research project should have a research component to train students in scientific methodology and a mentoring component to train students in scientific data analysis.
3. Student must be involved in the analysis of research data.
4. The head of the laboratory is a Rutgers/RWJMS faculty.

In the event that in-person undergraduate research is not permitted on campus, literature search or remote data analysis under the mentorship of a Rutgers/RWJMS research laboratory will be permitted to fulfill the CBN research requirement.

Spring research application deadline: Sept 30, 2023

Spring progress report deadline: Dec. 4, 2023 (before the last week of school)

OFFICE HOURS / STUDENT SUPPORT HOURS:

Students can schedule meetings with faculty coordinator as needed.

COURSE DESCRIPTION:

This course aims to provide students a capstone experience to apply and further their classroom knowledge in research under the mentorship of Rutgers/RWJMS laboratories.

To gain maximal experience from this research program, students should:



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- Arrange course schedules to accommodate a minimum block of 8-10 hours of free time each week for laboratory research.
- Find a laboratory of interest by reviewing lab research websites at CBN “Research for credits” website. Email laboratory professors to apply for acceptance into a laboratory for undergraduate research.

Six credits of CBN Junior and Senior research can be used to fulfill the CBN major elective and lab requirements.

Prerequisites

- General Biology 119:115-116 or 119:101-102
- Intended for Senior students who intend to major in CBN who have been accepted into a Rutgers/RWJMS laboratory for supervised research.

REQUIRED TEXTS AND COURSE MATERIALS:

None. Resources to help students writing research progress report are available at the course Canvas site.

TECHNICAL / TECHNOLOGY REQUIREMENTS:

A laptop with internet access for accessing course materials and submit research progress report to the course Canvas site AND to the research mentor.

Technology challenges:

Please visit the Rutgers Student Tech Guide page for resources available to all students. If you do not have the appropriate technology for financial reasons, please email Dean of Students deanofstudents@echo.rutgers.edu or complete the contact form for assistance. If you are facing other financial hardships, please visit the Office of Financial Aid at <https://financialaid.rutgers.edu/>.

COURSE LEARNING GOALS:

1. *Master factual and conceptual knowledge in cell biology and neuroscience that will provide a solid foundation for success in advanced training and professional careers.*

- Familiar with scientific methodology to acquire research data.
- Understand how to implement experiments correctly from laboratory protocols.
- Understand how to troubleshoot and modify experimental procedures.

2. *Develop an ability to summarize, integrate and organize information.*

- Know how to keep organized and update records of all experimental activities and observations.
- Know how to summarize, integrate and compare literature information relevant to the research project.
- Know how to organize data and literature information to write comprehensible and accurate science reports.

3. *Use scientific reasoning to evaluate the potential for current research and new discoveries to improve our understanding of cell biology and neuroscience and its relevance to human health and to our society.*



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- Know how to formulate a workable hypothesis based on proposed research project.
- Know how to analyze research and literature data in unbiased and quantitative manner.
- Know how to draw supported conclusions from available research and literature data to prove or disprove research hypothesis and plan future directions.

DEPARTMENTAL LEARNING GOALS:

<https://cbn.rutgers.edu/academics/undergraduate/learning-goals>

1. Master factual and conceptual knowledge in cell biology and neuroscience that will provide a solid foundation for success in advanced training and professional careers.
2. Develop an ability to summarize, integrate and organize information.
3. Use scientific reasoning to evaluate the potential for current research and new discoveries to improve our understanding of cell biology and neuroscience and its relevance to human health and to our society.

COURSE FORMAT:

Laboratory research:

- Students are expected to complete a minimum of 4-5 hours of laboratory research per week for each applied research credit.
- Once accepted into a laboratory, students should work out a mutually workable research schedule with their research mentors. It is recommended that students do not change that schedule without prior communication with their research mentors. Student research effort in the laboratory is part of a student's research grade.

Written progress report:

- A minimum of 10-page progress report in the format of a scientific manuscript is due before or at the designated deadline.
- The report must be submitted to the research mentor AND to the Canvas course "Progress report" site.

Progress report resources:

- At the Canvas course "Modules" site, students can find
- Research FAQs
- Progress report template
- Guidelines for research grade determination
- Writing checklist for progress report

GRADING SCALE:

- Student grades will be determined by the faculty research mentors and submitted directly to the course coordinator. Before the grade submission deadline, research mentors will be notified to submit student research grades based on student research effort and progress report quality. A copy of suggested guidelines for research grade assignment that will be sent to all research mentors can be found at the Canvas course "Modules/Student resources" site. The grade ranking is as follows:

- A** = excellent research effort and progress report
B+ = very good research effort and progress report
B = good research effort and progress report
C+ = OK research effort and progress report
C = barely passable research effort and progress report
D = unsatisfactory research effort and progress report
F = unacceptable research effort and progress report

POLICIES:**Academic Integrity Policy:**

Rutgers University takes academic dishonesty very seriously. By enrolling in this course, you assume responsibility for familiarizing yourself with the Academic Integrity Policy and the possible penalties (including suspension and expulsion) for violating the policy (<http://academicintegrity.rutgers.edu/academic-integrity-policy>) . As per the policy, all suspected violations will be reported to the Office of Student Conduct. Academic dishonesty includes (but is not limited to):

- *Cheating*
- *Plagiarism*
- *Aiding others in committing a violation or allowing others to use your work*
- *Failure to cite sources correctly*
- *Fabrication*
- *Using another person's ideas or words without attribution, including re-using a previous assignment*
- *Unauthorized collaboration*
- *Sabotaging another student's work*

If you are ever in doubt, consult your instructor.

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,



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referral to specialists in the community and consultation and collaboration with campus partners.

Crisis Intervention:

<http://health.rutgers.edu/medical-counseling-services/counseling/crisis-intervention>

Report a Concern: <http://health.rutgers.edu/do-something-to-help>

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, 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's 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.

** All information is subject to change at the discretion of the course coordinator.