Neuroscience Program Review 2023-24

Closing MOU **Date: August 23, 2024**

Overview

Degree/Certificate Programs Reviewed:	Interdisciplinary Bachelor of Science in Neuroscience Interdisciplinary Masters of Science in Neuroscience Interdisciplinary Doctor of Philosophy in Neuroscience
Program Directors & Dean:	Dr. Grant Mastick Co-Director, Neuroscience Major Dr. Dennis Matthew, Co-Director, Integrative Neuroscience Graduate Program Dr. Michael Webster, Co-Director Neuroscience Major and Co-Director, Neuroscience Graduate Program (until July 2024) Dr. Fang Jiang, Co-Director, Neuroscience Graduate Program (from July 2024) Dr. Louisa Hope-Weeks, Dean
External Reviewers & Affiliation:	Dr. Lynne Kiorpes, Dean, Graduate School of Arts and Sciences Dr. Barbara Dosher, Distinguished Professor Cognitive Sciences, University of California, Irvine
Date of External Visit:	February 25-27

Review Process Summary

The Interdisciplinary Neuroscience BS and MS/PhD programs was scheduled for regular program review as mandated by the Board of Regents and University policy. A self-study document for the programs was developed by the program faculty and completed in the Fall of 2024 for both the graduate and undergraduate Neuroscience programs. These reports were provided to the reviewers before they conducted a visit on February 25-27, 2024. The external reviewers reviewed the program and met with relevant faculty, staff, students and administrators to determine the programs' accomplishments, examine strengths and weaknesses, and identify opportunities as they plan for the future. A final report was issued by the review team shortly after the review visit. In accordance with institution practice, responses to the review were solicited from the program directors and the dean. A final meeting took place on August 26th, 2024. This document represents the final MOU of recommendations and findings from the review.

Signatures

Executive Vice President & Provost:	Jeffrey S. Thompson	Date:	10/17/2024
Vice Provost, Undergraduate Education:	David Shintani	Date:	10/17/24
Vice Provost, Graduate Education & Dean, Graduate School	Markus Kemmelmeier	Date:	10/17/24
Dean, College of Science:	Louisa Hope-Weeks	Date:	17-Oct-2024 | 10:53 AM PDT
Co-Director, Neuroscience Major	Grant Mastick	Date:	16-Oct-2024 | 4:17 PM PDT
Co-Director, Integrative Neuroscience Graduate Program	Dennis Mathew	Date:	16-Oct-2024 | 4:52 PM PDT
Co-Director, Neuroscience Major	Michael Webster	Date:	16-Oct-2024 | 4:14 PM PDT

Major Findings and Conclusions

The program review included two related but separate interdisciplinary programs: the BS degree in Neuroscience and the MS/PhD Neuroscience Graduate Program,. The BS degree is administered through the Departments of Psychology and Biology, which provide the courses and advising for the major. The graduate program is a multidisciplinary program with over 60 faculty from many campus units, including the Colleges of Liberal Arts, Science, and Engineering, and the School of Medicine. The program is directed by Neuroscience faculty and administered through the Graduate School. Both the undergraduate and graduate programs provide training in the core foundations of neuroscience, ranging from cellular mechanisms to cognition and behavior, with a wide range of options at the graduate level for advanced training and specialization within specific subdisciplines. Students develop their critical thinking and research skills in preparation for a wide range of possible avenues, including preparing undergraduate students for advanced degrees in neuroscience, medicine, or related programs, while preparing graduate students for career opportunities in academia or the public or private sectors.

The reviewers felt the Interdisciplinary Neuroscience programs at UNR have made great advancements in a short period of time largely based on collaborative commitment to the Neuroscience agenda and enthusiasm of key faculty to create important instructional programs and significant research infrastructure. This has been enhanced by strong extramural grant activities in support of this mission. Given the substantial growth in the undergraduate major and graduate programs, it is time to pause to redesign these programs and

clarify administrative support and representation. Some of this redesign could be accomplished with modest additional resources given current fiscal constraints. Over time, selective additional investments will enhance the effectiveness, visibility and stature of the programs.

The areas that the reviewers thought should be addressed are as follows:

- Neuroscience program leadership and faculty should carry out a planning exercise to consider the future organization and curriculum of both the undergraduate major and graduate training program. Both are now of a sufficient size that the programs might be re-imagined or be made into its own department. Detail the gain/loss of resource commitment if Neuroscience becomes its own department and assess the Impacts.
- Designate a point person/manager perhaps housed at the Institute for Neuroscience (which is a formal university institute). The Neuroscience programs and the campus should develop a plan to capitalize on the presence of the Institute to enhance visibility of the Neuroscience initiatives on campus and in the community.
- Create a MOU between Psychology and Biology. The undergraduate major has thrived through the collaboration and support by the two departments, but the contributions and obligations to the program should be codified so that these clear for both departments going forward.
- Review the Curriculum including teaching responsibilities. For both undergraduate and graduate programs more courses specific to Neuroscience are needed and should include the NS prefix. The undergraduate major needs more mid-level courses to create a strong and reliable course sequence for the curriculum. The graduate program needs to redesign the Foundation classes and make sure these are available and completed by students in the first year or year and a half of the program. The programs should also try to leverage classes offered by other campus units, like computer science and the medical school.
- Create a combined BS/MS program
- For the graduate program, institute a program-level annual review of and feedback to students, expanding beyond the student advisor's evaluation.
- For the undergraduate program, define who the Neuroscience faculty are or should be, and create and inventory of their resources. This could include Identifying current teaching faculty from Psychology and Biology and realign their role as mounting the Neuroscience major. Decide what is needed regarding adding more staff or adding additional duties to meet the program curriculum and advising.
- The Neuroscience program has created a significant portfolio of infrastructure in support of its research and teaching agenda. This has been largely supported by a Neuroscience COBRE grant that is in final Phase III. The program and campus should find ways to provide an ongoing support structure for the key Research Cores, and potentially seek efficiencies or synergy in coordination with cross-campus resources. This includes maintaining access to human fMRI infrastructure, perhaps by strengthening the cooperative agreement with Renown Health.

Next Steps for these Programs (topics will vary)

Undergraduate Program:

- Develop new NS-specific and NS-prefixed courses to help build the unique identity of the degree and remove redundancies in the degree requirements resulting from drawing on courses originally tailored for Psychology and Biology.
- Increase the access to lab-based courses and potentially develop new lab courses to alleviate the most critical bottleneck and shortcoming in the program.
- Assess the teaching and staff and resource needs to implement the restructured curriculum.
- Develop a BS/MS degree option to fast-track students interested in research careers and to bridge with the Neuroscience Graduate Program. The program is also currently incorporating neuroscience into the NevadaTeach dual-degree program for STEM majors through the College of Education.

Graduate Program:

- We plan to develop a 2-year sequence of 4 foundational courses that will include: a) Intro to Cellular/Molecular Neuroscience; b) Intro to Cognitive Neuroscience; c) Data Science and Coding; and d) Intro to Computational Neuroscience. These will be required for all students in their first and second year, which will also help better network students in the program.
- After this sequence we will structure the program into tracks allowing specialization in cellular, cognitive, or computational areas. Program faculty will be organized in terms of these tracks and will have the ability to define the courses and requirements that are most relevant to each area. This reorganization will also allow better monitoring and communication of potential elective courses for the different tracks.
- Explore restructuring the Cognitive and Brain Sciences graduate program (housed within Psychology) as a track within the Neuroscience program. This step will require discussion and approval of the CBS faculty (who are all also part of the larger Neuroscience program).
- We will also explore opportunities to collaborate with existing campus initiatives in data science (e.g., Data Science workshops led by Dr. Juli Petereit (Director of Nevada Bioinformatics Center), and Dr. Theresa McKim (Teaching faculty, Biology Dept.) and leverage resources from the Computational Cores to meet the training needs in data science and AI.
- Improve information about relevant course listings and enhance communication regarding elective options, thereby facilitating better planning for our graduate students. We also plan to develop a "pocket-guide" of neuroscience course listings that graduate students could consider taking during each year of their progression in grad school.
- Conduct annual reviews at the program level of student progress. The INP directors have already recommended to incoming graduate students to develop Individual Development Plans (IDPs) in conjunction with their respective research advisors, and IDPs are required for NIH-funded trainees. We will work towards implementing a structured review process that includes personalized development plans and self-assessments for all students.

Institute For Neuroscience

- Make decisions about the next director and about the institute organizational structure, scope of activities, and and reporting lines.
- Engage in discussions with university leadership to explore and implement the most effective reporting structure.

- We hope to capitalize on the presence of the Institute to enhance the visibility of Neuroscience initiatives on campus. The Institute for Neuroscience already serves as a vital platform for promoting our research and educational programs, and we are committed to expanding its role in public outreach and community engagement. This could include increased collaboration with local schools, hosting public events highlighting the importance of neuroscience research, and further developing the Institute's online presence to showcase our achievements and opportunities.

Vital Statistics on NSHE Reports

Number of students with declared major in the program area:

2022-2023	Interdisciplinary Bachelor of Science in Neuroscience	342
	Interdisciplinary Masters of Science in Neuroscience	5
	Interdisciplinary Doctor of Philosophy in Neuroscience	38

Number of graduates from the program for the following years:

2020-2021	Interdisciplinary Bachelor of Science in Neuroscience	90
	Interdisciplinary Masters of Science in Neuroscience	4
	Interdisciplinary Doctor of Philosophy in Neuroscience	3
2021-2022	Interdisciplinary Bachelor of Science in Neuroscience	82
	Interdisciplinary Masters of Science in Neuroscience	2
	Interdisciplinary Doctor of Philosophy in Neuroscience	2
2022-2023	Interdisciplinary Bachelor of Science in Neuroscience	65
	Interdisciplinary Masters of Science in Neuroscience	3
	Interdisciplinary Doctor of Philosophy in Neuroscience	6

Program-level graduation rate using first-time, full-time, degree-seeking cohort at 150 percent completion time:

2020-2021	Interdisciplinary Bachelor of Science in Neuroscience	49% n=35
	Interdisciplinary Masters of Science in Neuroscience	n/a
	Interdisciplinary Doctor of Philosophy in Neuroscience	n/a
2021-2022	Interdisciplinary Bachelor of Science in Neuroscience	49% n=41
	Interdisciplinary Masters of Science in Neuroscience	n/a
	Interdisciplinary Doctor of Philosophy in Neuroscience	n/a

2022-2023	Interdisciplinary Bachelor of Science in Neuroscience	49% n=49
	Interdisciplinary Masters of Science in Neuroscience	100% n=1
	Interdisciplinary Doctor of Philosophy in Neuroscience	n/a

Headcount of students enrolled in any course related to the program (duplicated):

2022-2023	Interdisciplinary Bachelor of Science in Neuroscience	322
	Interdisciplinary Masters of Science in Neuroscience	n/a
	Interdisciplinary Doctor of Philosophy in Neuroscience	n/a

*the graduate level classes for Interdisciplinary Neuroscience consist of Psychology and Biology Courses.