

Project title: Neuroscience @ Whitman - Planning for a combined major, interdisciplinary minor, or concentration

Project Participants: Nancy Day, Ginger Withers, Chris Wallace

Project Duration: April 2022 - March 2023

Project Type: Other—Cross-disciplinary initiative

Overview

The primary goal of this project was to develop a sustainable curriculum at Whitman that addresses student desire for coursework in neuroscience, leveraging the expertise of current faculty and building synergistically upon strengths of existing departments. Whitman has long been interested in bringing Neuroscience to the college, approving the first designated tenure line to teach neuroscience in Biology in 2000, and most recently adding a tenure line earmarked to teach neuroscience within Psychology in 2019. Although the college did not earmark the tenure line created for Biology in 2007 for neuroscience, a serendipitous hire in that position (L. Knight, T. Knight) brought additional neuroscience expertise. A pilot introductory behavioral neuroscience course called Cells to Brain to Mind, designed as a collaboration between Biology and Psychology faculty. Offered in the Psychology Department at the 200 level, it filled to capacity every time it was offered beginning in 2018, and drew many students from across the college including majors in Biology, BBMB, and Chemistry, demonstrating strong interest amongst a broad cohort of students for interdisciplinary work of this kind.

The present project represents the 3rd iteration of collaborative faculty brainstorming to formalize neuroscience training within our existing curriculum. While we recognize that the simplest approach would be to gather the 5 faculty with PhDs in neuroscience into a new neuroscience major, this is in tension with their home departments as it would take those faculty away from their primary commitments to those programs. Thus we sought to develop an approach that would not compromise the staffing of home departments. We were also cautious to avoid chasing trends in a superficial way by offering something called neuroscience without being able to offer an adequate number of neuroscience courses.

Project outcomes and alignment with original goals

We proposed the following specific goals:

- Goal 1. Investigate “popularity” of neuroscience major/minor/concentration programs relative to biology & psychology majors at different institutions to guide potential interest in different curricular options (e.g. major vs. minor).
 - **Outcome:** The information we gathered came as no surprise to us. Discussions with officers in Admissions, Communications, as well as analysis of IPMs, and informal conversations with students all suggested a strong interest in a neuroscience program. Surveys of peer institutions, all of which offer some kind of neuroscience degree credential, also encouraged development of neuroscience curriculum in order to be competitive in recruiting prospective students.
- Goal 2. Identify the feasibility of a combined Biology-Psychology major or interdisciplinary minor through conversations with colleagues who might contribute relevant courses.

- **Outcome:** The most recent planning meeting (prompted by the FSR) convened in May '21 to address ways that we could bring neuroscience to Whitman as curricular innovation. That meeting included a broad group of people from Biology, Psychology, Philosophy, CS, and other programs. At the end of that meeting, the group concluded that a curriculum shared between Biology and Psychology could best take advantage of expertise already on campus, and recommended an innovation grant to develop such a program. This consensus confirmed a central weakness of a previously proposed interdisciplinary major, which was that with involvement of multiple departments and programs came a curricular “brittleness.” For example, having a formal contribution from CS in something like neural modeling/AI would be wonderful, but the faculty able to offer such a course could only commit to offer it every 3 years, and regrettably subsequently left the college.

A combined major proved to be far more feasible than a minor or a concentration. It allowed for more courses to be fluidly integrated into the curriculum, did not require new courses beyond the capstone, and balanced advising and capstone supervision across faculty participants and departments.

Both a concentration, and a minor would require additional credits beyond a single major, and so we concluded that both models would come at the expense of flexibility in general education and limit the opportunity to study abroad.

- Goal 3. Draft plans for either a combined major or interdisciplinary minor which will include:
 - Learning goals for the program;
 - Identification of existing courses that could contribute to the program;
 - Descriptions of and goals for introductory and capstone courses;
 - A curriculum plan that students would complete; and,
 - Resource implications for (primarily) the biology and psychology departments
 - **Outcome:** These are addressed in the catalog copy, the draft of which is linked here: [Approved catalog copy](#), or the [major proposal document](#) (Resource Implications)
- Goal 4. Submit the proposal to the curriculum committee for a (hopeful) adoption for the 2023-24 academic year.
 - **Outcome:** The timeline for approval was somewhat accelerated by new guidelines from the curriculum committee requiring all new programs be submitted by the end of the fall semester. We are delighted to announce a new combined major, Brain, Behavior, and Cognition (BB&C), approved by the Curriculum Committee and by the Faculty in FA'22. This new major will be in place for the '23-'24 academic year.

Contributions to enhanced student learning and assessment of success

The new Brain, Behavior, and Cognition major both addresses Whitman’s strategic priority of innovating the curriculum, and contributes to enhanced student learning, by creating opportunities to study brain science. As the name of the new major suggests, this is an interdisciplinary program that integrates not only Biology and Psychology courses, but can be tailored toward individual interests of students. For

example, a student who is interested in cognitive science can choose courses in cognitive psychology and philosophy, while someone interested in brain (neuro)science can choose from courses in molecular genetics, physiology and cell biology. Program success will be assessed through a review, and potential revision, of the major after 3 years. Other metrics of success will review performance in mastering learning objectives as students progress through the major, and in senior assessments. In addition, we are interested in determining how successful this major is in attracting and retaining students. Over the next year, we will explore ways to assess that.

Limitations or failings of the project, and how, in retrospect, might they have been better addressed or remedied

Our work in the planning phase of this inquiry grant suggested a desire by the college for curricular innovation in neuroscience at Whitman, but there has always been strong pressure to develop a program that would be cost-neutral in terms of faculty allocation. This concern was sharpened in the FSR era. This proposal represents a compact and pragmatic mechanism for jumpstarting a program that we believe will grow. The BB&C curriculum we built achieves near cost-neutrality, with the exception of a new BB&C senior seminar course that, at this time, will be offered as an overload in faculty time.

While we would like to offer a curriculum that has a stronger neuroscience component (e.g. courses like molecular and cellular neuroscience, neural development, hormones and behavior) offering those courses would necessarily come at the expense of teaching courses in home departments (e.g. 100 level introductory courses) that are part of our specified teaching duties. That can only be remedied by changing how teaching duties in home departments are assigned. Given that both Biology and Psychology departments have high enrollments, and are already challenged to cover core courses in their majors, additional staffing in both departments (or a shared position between departments) would be required to create a 'true' neuroscience major.

- How do you envision sharing the results of your work with other colleagues at Whitman (or elsewhere)?

The major proposal and draft catalog copy were distributed to the faculty, and all faculty members were given the opportunity to ask questions prior to the approval vote. We are already working with Communications and Admissions to develop material that will publicize the new major, and are planning to build information sheets that can help colleagues advise potential BB&C majors, particularly in the years before major declaration. We expect to also meet with Development to discuss fundraising opportunities. As active participants in the professional society "Faculty for Undergraduate Neuroscience", we anticipate opportunities to share information more broadly through panels and poster sessions. Lastly, we are excited to interact with our colleagues in the NW5C through the programs/opportunities that arise through that network.