Interdisciplinary Minor in Neuroscience
Undergraduate Minor
Assessment Report from AY 2022-2023; Submitted October 30th, 2023

Submitted by Dr. Marisa Knight, Incoming/New Program Director & Faculty Assessment Coordinator: Interdisciplinary Minor in Neuroscience

Please send feedback to mrknight@usfca.edu

Mission Statement (no changes):
The interdisciplinary field of neuroscience is one of the most exciting and rapidly growing areas within the sciences. Our interdisciplinary minor in neuroscience draws from traditional natural and social science areas to help students better understand the structure and function of the nervous system and how activity within the nervous system gives rise to behavior. The neuroscience minor provides an interdisciplinary approach to studying these relationships, encompassing elements of biology, chemistry, kinesiology, philosophy and psychology.

Program Learning Outcomes (no changes):

PLO 1: Students will be able to describe the basic anatomy and physiology of the nervous system.

PLO 2: Students will be able to describe how the activity of the nervous system is related to behaviors (e.g., emotions, memory, mental illness).

PLO 3: Students will be able to critically evaluate the implications and limitations of neuroscientific research.

Neuroscience Minor Curriculum Map (no changes):

	PLO1	PLO2	PLO3
Courses X Program Learning Outcomes	Students will be able to describe the basic anatomy and physiology of the nervous system.	Students will be able to describe how the activity of the nervous system is related to behaviors (e.g., emotions, memory, mental illness).	Students will be able to critically evaluate the implications and limitations of neuroscientific research.
Courses			
BIOL 105/105L: General Biology	I	I	I
PSYC 270: Biological Psychology	I	I	I
BIOL 115/116: Survey of Human Physiology	I	I	I
BIOL 350/351: Comparative Animal Physiology	D	D	D
BIOL 333/334: Endocrinology	D	D	D
BIOL 340: Animal Toxicology	D	D	D
KIN 340: Neuroscience	M	M	M
BIOL 368: Neurobiology	M	M	M
PSYC 319: Cognitive Psychology	D	D	D
PSYC 326: Learning and Memory	D	D	D
PSYC 351: Human Neuropsychology	D	D	D
	Key: I = Introductory		
	D = Developing		
	M = Mastery		

Assessment Schedule (Past Assessments):
As the Fall 2021 incoming Neuroscience Minor Director, one major goal was to work toward establishing a regular assessment program. This ongoing effort continues with the collection of relevant materials and support from colleagues who teach courses in the minor. Our first assessment of the Neuroscience minor since the establishment of this major objective was carried out in AY 2021/2022. It was a direct assessment of PLOs 1 and 2 for Biological Psychology (PSYC 270).

The minor is comprised of different tracks, specialized for students from several different majors, and fluctuates in size (ranging from 70-150 since program assessment started). Because the minor director and the department to which this individual belongs do not control the scheduling or staffing of courses within the minor, our program assessment relies on available courses with willing instructors.

2022-2023 Assessment:

We assessed the first and second program learning outcomes for Human Physiology (BIOL 115/116). Biology 115/116 is a survey of the organs and organ systems in the human, with an emphasis on the functioning of these organ systems to maintain homeostasis. This course is intended for those enrolled in one of the following programs: Nursing Major, Kinesiology Major, Neuroscience Minor, Gerontology Minor.

PLO 1: Students will be able to describe the basic anatomy and physiology of the nervous system.

PLO 2: Students will be able to describe how the activity of the nervous system is related to behaviors (e.g., emotions, memory, mental illness).

Methodology Used:

Assessment Measure: Student Work

This assessment relied on the collaborative efforts of myself and Dr. Leslie Bach, an experienced instructor of BIOL 115/116 who provided the student work and consulted on item selection and scoring. The measure has been provided as a separate attachment to the email address provided (assessment_cas@usfca.edu).

Dr. Bach provided access to direct samples of student work on the Canvas course website. The assessment items consisted of exam questions with sound psychometric properties. The resulting item pool sampled the content space of the unit covering nervous system anatomy and physiology. The items were evaluated based on how well they measured Program Learning Outcomes 1 and 2.

Item selection was carried out with the goal of providing evidence of student mastery and offering diagnostic value for the teaching and learning process. Item difficulty level was one consideration. Obvious wrong answers were not provided among the choices to avoid conflating students' common sense with their mastery of course-specific knowledge and raise chance level performance above 25% yielding artificially inflated scores.

The final set of items consisted of 20 total items: 12 multiple choice questions that assessed PLO #1 (items 1, 2, 3, 7, 9, 10, 11, 18, 19, 20, 22, 24); 8 multiple choice questions that assessed PLO #2 (items 13a, 13b, 13c, 13d, 13e, 14, 15, 17)

Note: 2 independent coders identified 1 additional multiple-choice item that simultaneously assessed PLOs 1 and 2 (item 5). Because this item did not discriminate and map directly to a single PLO, it was excluded from the set of items used in computations of final outcomes for this assessment.

The test was administered in the second week of March of the spring semester. Scores for Neuroscience Minors were isolated and analyzed separately from the larger dataset. Students were instructed to work independently without consulting other sources. The test was administered to Prof. Bach's section of Human Physiology in Spring 2022. Out of a total of 47 students enrolled in the section, 7 were Neuroscience minors and each student completed the measure.

Assessment Rubric

The **Assessment Rubric** was set by considering the course level and its intended goal in the interdisciplinary neuroscience minor curriculum. Human Physiology is one of our two foundation courses for all minors. Our curricular map shows that this course aims to "introduce" students to PLOs 1 and 2 (whereas higher level courses have the respective aims to "develop" and "master" the PLOs). Our rubric classified student performance into the categories of 12 (PLO 1) and 8 (PLO 2) correct items = complete mastery of the outcomes, 8-11 (PLO 1) and 6-7 (PLO 2) correct items = mastered most of the outcome, 3-7 (PLO 1) and 3-5 (PLO 2) correct items = mastered some parts of the outcome, 0-2 (PLO 1) and 0-2 (PLO 2) correct items = did not master outcome at level intended.

IV. RESULTS & MAJOR FINDINGS

What are the major takeaways from your assessment exercise?

This section is for you to highlight the results of the exercise. Pertinent information here would include:

a. how well students mastered the outcome at the level they were intended to:

BIOL 115/116 is a foundational course for neuroscience minors. The overall findings show strong evidence of mastery at the intended level, which was defined as mastery of at least some parts (2 out of 5 items correct) of the outcome to complete mastery (5 out of 5 items correct) of the outcome. In this case, for both PLO #1 and PLO #2, 100% of neuroscience minors (7 out of 7) demonstrated mastery at the intended level. Looking more closely at the data, 28.6% showed complete mastery of PLO #1 and 71.4% mastered most parts. For PLO #2, 100% of Neuroscience Minors showed complete mastery.

a. any trends noticed over the past few assessment cycles

N/A

b. the levels at which students mastered the outcome based on the rubric used.

To address this, among many other options, one option is to use a table showing the distribution.

Results:

PLO #1 – Mastery Level Percentage - BIOL 115/116 – Neuroscience Minors (N=7)

Level	% Total Sample
Complete Mastery	28.6% (2 of 7 students)
Mastered Most Parts	71.4% (5 of 7 students)
Mastered Some Parts	0%
Did not Master at Level Intended	0%

*12 correct items=complete mastery of the outcome, 8-11 correct items=mastered most of the outcome, 3-7 correct items=mastered some parts of the outcome, 0-2 correct items=did not master outcome at level intended.

PLO #2 – Mastery Level Percentage - BIOL 115/116 - Neuroscience Minors (N=7)

Level	% Total Sample
Complete Mastery	100%
Mastered Most Parts	0%
Mastered Some Parts	0%
Did not Master at Level Intended	0%

*8 correct items=complete mastery of the outcome, 6-7 correct items=mastered most of the outcome, 3-5 correct items=mastered some parts of the outcome, 0-2 correct items=did not master outcome at level intended.

To summarize, what we have learned is that the foundational Human Physiology course we require our minors to take is meeting our mission and PLOs #1 and #2.

V. CLOSING THE LOOP

Description of how the results were shared with faculty and how your department/program responded to the results. This is where you should lay out any plans for future improvement or assessment of your program indicated by the results.

We find the outcomes from this initial assessment encouraging. Overall, we were pleased to see most minors demonstrating mastery at the intended level for both PLOs at this early stage in the minor. At the same time, we recognize that it will be most informative to have more than one method to assess these PLOs in the future to provide converging evidence regarding student mastery level and the validity and reliability of this particular measure. As our assessment work continues, we will be working to develop

additional assessment methods for each course in the Minor. Our priority is currently with establishing at least one direct method of assessment for each course currently included.

Moving forward, data from additional courses in the minor that have not yet been assessed will be the goal for future assessments. I continue to move forward in building our assessment program by meeting with instructors who teach courses in the interdisciplinary minor to build a sense of community and collegiality and to explain the importance and relevant key points regarding assessment practices and the need to work together to support the minor in this way. I will continue to review course syllabi and identify student work to provide direct measures we can use to carry out future assessments in each of these courses. I am continuing the process of creating rubrics for the student work assignments I have already identified as showing promise as direct measures for future assessments.

Working toward the further establishment and development of a functional and consistent assessment program, combined with the advising load for this interdisciplinary minor and the development of a new major in Neuroscience, continues to present some formidable challenges. That said, we are encouraged with the progress that has been made and we look forward to continuing our assessments to evaluate student outcomes in each of our foundation, core and elective courses.

ADDITIONAL MATERIALS

(Any rubrics used for assessment, relevant tables, charts and figures could be included here)

The rubric and relevant tables appear in the Methodology section. The assessment measure has been included as a separate electronic attachment at the time of submission.

Thank you!