SAINT LOUIS UNIVERSITY.

Program-Level Assessment: Annual Report

Program Name (no acronyms): **Neuroscience**	Department: **Biology/Psychology**
Degree or Certificate Level: **BS**	College/School: **A&S**
Date (Month/Year): **September 2023**	Assessment Contact: **Jennifer Elwyn**

In what year was the data upon which this report is based collected? **2022-23**

In what year was the program's assessment plan most recently reviewed/updated? **2015**

Is this program accredited by an external program/disciplinary/specialized accrediting organization or subject to state/licensure requirements? **No**

If yes, please share how this affects the program's assessment process (e.g., number of learning outcomes assessed, mandated exams or other assessment methods, schedule or timing of assessment, etc.):

1. Student Learning Outcomes
Which of the program's student learning outcomes were assessed in this annual assessment cycle? (Please provide the complete list of the program's learning outcome statements and **bold** the SLOs assessed in this cycle.)

Program Learning Outcome 1: *Students will be able to identify core concepts of neuroscience.*

2. Assessment Methods: Artifacts of Student Learning
Which artifacts of student learning were used to determine if students achieved the outcome(s)? Please describe the artifacts in detail, identify the course(s) in which they were collected, and if they are from program majors/graduates and/or other students. Clarify if any such courses were offered a) online, b) at the Madrid campus, or c) at any other off-campus location.

Our assessment plan called for collecting information from three sources to assess Learning Outcome 1, two courses, *NEUR 3400: Introduction to Neuroscience I: Molecular, Cellular, & Systemic* and *NEUR 3500: Introduction to Neuroscience II: Behavioral & Cognitive*, and indirect self-assessment on a senior survey.

Instructors of NEUR 3400: *Introduction to Neuroscience I: Molecular, Cellular, & Systemic* and NEUR 3500: *Neuroscience II: Behavioral & Cognitive* included specific exam and quiz questions addressing core concepts of neuroscience. Core concepts came from the *Society for Neuroscience*, the preeminent organization of neuroscience research and education (see http://www.brainfacts.org/about-neuroscience/core-concepts/). Student responses on these questions were assessed to determine level of mastery of these concepts.

For the Senior survey, students were asked a series of self-assessment questions about how much they gained in their knowledge of neuroscience core concepts. Madrid courses are not applicable to this assessment report.

3. Assessment Methods: Evaluation Process
What process was used to evaluate the artifacts of student learning, and by whom? Please identify the tools(s) (e.g., a rubric) used in the process and **include them in/with this report document** (please do not just refer to the assessment plan).

Instructors of NEUR 3400 and NEUR 3500 aligned multiple choice exam and quiz questions with core concepts. For NEUR 3400, Dr. Alaina Baker-Nigh collected and analyzed the data. For NEUR 3500, Dr. Brenda Kirchhoff collected and analyzed the data.

A link to a Senior Survey was sent to all graduating students. Reminders were sent to students who did not comply. Sixteen graduating students completed the survey. Drs. Buchanan and Ogilvie were involved in writing the survey questions, collecting the data, and analysis.

4. **Data/Results**
   What were the results of the assessment of the learning outcome(s)? Please be specific. Does achievement differ by teaching modality (e.g., online vs. face-to-face) or on-ground location (e.g., STL campus, Madrid campus, other off-campus site)?

For NEUR 3400: *Introduction to Neuroscience I: Molecular, Cellular, & Systemic*, 5 core concepts were selected by Dr. Baker-Nigh. This class is taken primarily by sophomores and included 54 students in Spring 2023. Results from this assessment demonstrate that the questions were answered correctly by 89% of the students.

For NEUR 3500: *Neuroscience II: Behavioral & Cognitive,* 8 core concepts were selected by Dr. Kirchhoff. Data were collected from 58 students, primarily sophomores. Results from this assessment demonstrate that the questions were answered correctly by 91% of the students.

We consider these results to be well above the 'proficient' level of competency (defined as 75% correct performance). See attached table for questions, core concepts, and student performance summary.

Self-assessment questions from the senior survey asked how much students gained in knowledge about the core concepts of neuroscience.

Core concepts: 100% of graduating Neuroscience majors reported some gain in their ability to identify the core concepts of neuroscience. Specifically, 15% reported a *small gain*, 31% reported a *large gain* and 54% reported a *very large gain* in their ability to identify the core concepts of neuroscience and 0% reporting a *moderate or no gain* in this ability.

Twenty percent of students indicated that *Introduction to Neuroscience: Cellular, Molecular, & Systemic (NEUR 3400)* was beneficial regarding their ability to identify the core concepts of neuroscience and 24% indicated that *Introduction to Neuroscience: Behavioral & Cognitive (NEUR 3500)* was beneficial in this regard. Other courses that students reported as beneficial were *Neuroscience Laboratory (NEUR 3550), Brain, Mind, & Society (PSY 3100), Cell Structure & Function (BIOL 3040), General Psychology (PSY 1010), Cellular Biochemistry & Molecular Biology (BIOL 3020), and Foundations of Research Methods & Statistics (PSY 2050).*

We consider these results to be well above the 'proficient' level of competency (defined as 75% reporting gains in abilities).

5. **Findings: Interpretations & Conclusions**
   What have you learned from these results? What does the data tell you? Address both a) learning gaps and possible curricular or pedagogical remedies, and b) strengths of curriculum and pedagogy.

   Overall, both indirect (self-reported) and direct data indicate that we are successfully achieving Learning Outcome 1 at critical points in the curriculum. We are especially pleased that our introductory course sequence, taken by sophomores and juniors, is contributing to Learning Outcome 1 in a meaningful way.

6. **Closing the Loop: Dissemination and Use of <u>Current</u> Assessment Findings**
   A. When and how did your program faculty share and discuss the results and findings from this cycle of assessment?
   Assessment data were shared and discussed with all Neuroscience faculty at our September 2023 meeting.

   B. How specifically have you decided to use these findings to improve teaching and learning in your program? For example, perhaps you've initiated one or more of the following:

Changes to the Curriculum or Pedagogies	• Course content	• Course sequence
	• Teaching techniques	• New courses
	• Improvements in technology	• Deletion of courses
	• Prerequisites	• Changes in frequency or scheduling of course offerings
Changes to the Assessment Plan	• Student learning outcomes	• Evaluation tools (e.g., rubrics)
	• Artifacts of student learning	• Data collection methods
	• Evaluation process	• Frequency of data collection

Please describe the actions you are taking as a result of these findings.

> Two points were raised at our faculty meeting. First, we were disappointed by the low response rate to the senior survey. To remedy this low response rate, we plan to ask instructors to make time in NEUR 4900 and capstone courses for students to fill out the survey.
>
> Secondly, we discussed the selection of core concepts used for this assessment. The Faculty for Undergraduate Neuroscience, a national organization of neuroscience educators, has recently published new core concepts for neuroscience (Chen et al., 2022). We plan to adopt these new core concepts the next time we assess this learning outcome.
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> Chen, A., Phillips, K. A., Schaefer, J. E., & Sonner, P. M. (2022). The Development of Core Concepts for Neuroscience Higher Education. *The Journal of Undergraduate Neuroscience Education (JUNE),* Winter 2022, *20(2):*A160-A164

If no changes are being made, please explain why.

> These data show that we are successfully achieving Learning Outcome 1 and we are undergoing our Academic Program Review in AY2023-24. We will await recommendations from the Academic Program Review before making changes.

7. **Closing the Loop: Review of Previous Assessment Findings and Changes**
   A. What is at least one change your program has implemented in recent years **as a result of previous assessment data**?

   > To determine which of our classes most contribute to students' indirect achievement of our learning objectives, we added follow-up questions to our student survey about which courses were most beneficial for each objective.

   B. How has the change/have these changes identified in 7A been assessed?

   > We document which courses are most commonly mentioned in student reports.

   C. What were the findings of the assessment?

   > As noted in Section 4 above, we can document which courses that students find most effective in enhancing their achievement of each of our learning outcomes.

   D. How do you plan to (continue to) use this information moving forward?

   > We plan to keep asking these questions and adding in new courses as options for students to include in their reports.

IMPORTANT: Please submit any assessment tools (e.g., artifact prompts, rubrics) with this report as separate attachments or copied and pasted/appended into this Word document. Please do not just refer to the assessment

plan; the report should serve as a stand-alone document. Thank you.

LEARNING OUTCOME ASSESMENT DATA from NEUR 3400

Question	Attempts	Misses	% correct
1B_final	12	3	0.75
1D_midterm	51	1	0.98
1F_quizI	54	2	0.96
2A_quizII.a	45	1	0.98
2A_quizII.b	37	11	0.70
2B_midterm	49	8	0.84
2C_midterm	50	2	0.96
2D_final	15	1	0.93
2E_final	16	1	0.94
2G_midterm	48	6	0.88
3B_final.a	22	0	1.00
3B_final.b	20	0	1.00
3D_quizII	37	6	0.84
7C_quizI	54	9	0.83
8B_final.a	18	1	0.94
8B_final.b	20	3	0.85
8C_final	25	8	0.68
Average	34.83	3.71	0.89

LEARNING OUTCOME ASSESMENT DATA from NEUR 3500

Question 1 - E1 Q3/Q8

	Right	Wrong	Total	Percent
Section 1	19	2	21	90.48%
Section 2	37	0	37	100.00%
Total	56	2	58	96.55%

Question 2 - E1 Q14/Q10

	Right	Wrong	Total	Percent
Section 1	16	5	21	76.19%
Section 2	29	8	37	78.38%
Total	45	13	58	77.59%

Question 3 - E2 Q5/12

	Right	Wrong	Total	Percent
Section 1	17	4	21	80.95%
Section 2	36	1	37	97.30%
Total	53	5	58	91.38%

Question 4 - E2 Q7/14

	Right	Wrong	Total	Percent
Section 1	14	7	21	66.67%
Section 2	34	3	37	91.89%
Total	48	10	58	82.76%

Question 5 - E2 Q11/16

	Right	Wrong	Total	Percent
Section 1	21	0	21	100.00%
Section 2	36	1	37	97.30%
Total	57	1	58	98.28%

Question 6 - E2 Q14/5

	Right	Wrong	Total	Percent
Section 1	21	0	21	100.00%
Section 2	35	2	37	94.59%
Total	56	2	58	96.55%

Question 7 - E3 Q2/4

	Right	Wrong	Total	Percent
Section 1	20	0	20	100.00%
Section 2	36	2	38	94.74%
Total	56	2	58	96.55%

Question 8 - E3 Q6/1

	Right	Wrong	Total	Percent
Section 1	18	2	20	90.00%

Section 2	35	3	38	92.11%
Total	53	5	58	91.38%

Question 9 - E3 Q16/16

	Right	Wrong	Total	Percent
Section 1	16	4	20	80.00%
Section 2	35	3	38	92.11%
Total	51	7	58	87.93%

All Questions

	Right	Wrong	Total	Percent
Total	475	47	522	91.00%