Annual Assessment Report
The Study of the Mind / Neuroscience Program
May 31st, 2023
Dr. James M. Dow

The interdisciplinary Study of the Mind / Neuroscience program is completing its sixth year. The program incorporates required courses from the natural sciences, the social sciences, and the humanities. 2022-2023 is the third year we offered the Study of the Mind major and the neuroscience minor. In the spring of 2024, we will graduate our last Neuroscience Major (in their 5th year). In 2017, we had three graduates; in 2018, five graduates; in 2019, nine graduates; in 2020, six graduates; in 2021, eight graduates; in 2022, 9 graduates; in 2023, 10 graduates; and we currently have 9 declared majors in Study of the Mind. In our assessment plan outlined in 2022, we discussed that we would assess learning goals 5, 6, and 7. In our assessment meeting, which occurred on May 8th in Ellis Hall we talked about data for our assessment of learning goals 5, 6, and 7 and discussed future assessment plans. (Please see agenda with attendance attached.) We continued to use a senior capstone rubric to assess seniors that enabled direct assessment of learning goals in the program, specifically learning goals 5, 6, and 7, and used direct assessment of Learning goals 3 and 4 in our required courses.

Chair of Program, Senior Seminar, and Capstone

We anointed a new chair of the Study of the Mind / Neuroscience program; Dr. Gabe Ferrer will become chair of the Study of the Mind / Neuroscience program starting in the Fall 2023. Dr. Carmen Merrick taught the course this year for the second time. The course continued to encourage students to do independent weekly research on interdisciplinary topics of their choosing. The students completed a course paper that was interdisciplinary in nature and integrated two disciplines of the students choosing. The capstone project was the final interdisciplinary course paper in the course. Dr. Merrick used the rubric that was tied to learning goals and used the revised senior survey to reflect the assessment of learning goals for the Study of the Mind. Given that the major is an interdisciplinary major, the assessment of the success of the major depends upon determining if students are integrating concepts, principles, and frameworks throughout and at the culmination of the major. Successful interdisciplinary work depends upon having disciplinary knowledge prior to integration. Dr. Merrick hopes to continue to teach senior seminar in Spring 2024 if the Psychology department can make room in her schedule.

Action Plan for Improvement

Table 1: Direct Assessment 2023

	LG1: Understand, explain, predict, and model the relationships between the brain and nervous system, cognition, behavior, and the environment.	LG2: Rigorously apply the scientific method to questions that arise from the study of the mind and brain.	LG3: Gain foundational knowledge from philosophy, psychology, biology, and computer science.	LG4: Integrate the concepts, principles, and methods from multiple disciplines pertinent to the study of the mind.	LG5: Demonstrate critical reading and thinking skills that allow students to assess and contextualize interdisciplinary literature in the study of the mind and neuroscience.	LG6: Demonstrate an understanding of the ethical issues in the field of study of the mind and neuroscience and the approaches researchers use to confront them.	LG7: Demonstrate competency in oral and written scientific communication skills.
1	5	4	5	5	5	5	5
2	5	5	5	5	5	5	5
3	5	4	5	5	4	5	5
4	5	4	5	5	5	5	5
5	5	4	5	4	4	5	5
6	4	4	4	3	4	5	5
7	5	5	5	5	5	5	5
8	4	3	4	3	4	5	3
9	5	4	4	4	5	5	4
10	4	4	4	3	4	5	4
11	4	4	4	4	4	5	4
		1	Does not Meet Standards				
		2	Developing Achievement				
		3	Competent Achievement				
		4	Proficient Achievement				
		5	Mastery				

Table 2: Indirect Assessment 2023 Senior Survey

LG_1	LG_2	LG_3	LG_4	LG_5	LG_6	LG_7
5	5	4	4	5	5	4
4	4	5	4	5	5	4
5	5	5	5	5	5	5
5	5	5	5	5	5	5
4	5	5	5	5	5	5
5	4	4	4	5	5	5
4	3	4	5	4	5	4
4.57	**4.43**	**4.57**	**4.57**	**4.86**	**5.00**	**4.57**

We met on December 14th, 2022 to prepare the department for assessment for the year. In our conversations in the assessment meeting on May 8th, we discussed our assessment of learning goals 5, 6, and 7 in the last year. Three major imports developed from our discussions about learning goal 5, 6, and 7. In the case of learning goal 5, we discussed how the phrase "interdisciplinary literature" isn't really common enough for us to have a learning goal and we decided to revise that learning goal to just 'literature' next year. In the case of learning goal 6, we discussed how Social Neuroscience, Philosophy of Mind, and Philosophy of Science incorporate questions about morality, values, and ethics into courses and that may be something that could be revisited in later assessment cycles. In the case of learning goal 7, the biggest import was that although we ask students to write papers in many of our courses, it we only ask students to do presentations in senior seminar. We discussed whether doing presentations in PHIL 390 Philosophy of Mind would be possible.

Assessment of Learning Goal 5

Direct assessment was done in Senior Seminar and as a department as a whole throughout required courses. Direct assessment of learning goal 5 (see table 1 above) is a 4.45. In PHIL 390 Philosophy of Mind, the second paper in the course is involves integrating multiple disciplinary points of view. Of the 11 Mind / Neuro majors in PHIL 390 in Spring 2023, 8 were proficient in achieving learning goal 5 and 3 mastered the goal. Indirect assessment of learning goal 5 (see table 2 above) was done through senior survey and the result is a 4.86. After discussing this data, we discussed the wording of this learning goal and decided to revise it to: "5. Demonstrate critical reading and thinking skills that allow students to assess and contextualize literature in the study of the mind and neuroscience" removing "interdisciplinary." One reason is that learning goal 4 already focuses on interdisciplinarity and the second reason is that we don't really explicitly teach "interdisciplinary literature," but instead are encouraging the students to write and present their own interdisciplinary research. We also decided that future assessment did not need to include rubrics for methods components or rubrics for literature reviews in core courses, as our collection of data is sufficient for assessment.

Assessment of Learning Goal Six

Direct assessment was done in Senior Seminar, as a department as a whole throughout required courses, and through the human subjects research ethics training. Direct assessment of learning goal 6 (see table 1 above) is a 5. In PHIL 390 Philosophy of Mind, the third paper in the course is on empathy and values. Of the 11 Mind / Neuro majors in PHIL 390 in Spring 2023, 1 did not meet standards, 2 were proficient in achievement, and 8 mastered the goal. Indirect assessment of learning goal 6 (see table 2 above) was done through senior survey and the result is a 5. Based on this data we do not recommend any changes to the assessment of learning goal six. Students are well-served in the area of research ethics and in connecting study of the mind and neuroscience to questions about values, morality, and ethics.

Assessment of Learning Goal Seven

Direct assessment was done in Senior Seminar and as a department as a whole throughout required courses. Direct assessment of learning goal 7 (see table 1 above) is a 4.56. Indirect assessment of learning goal 7 (see table 2 above) was done through senior survey and the result is a 4.57. Based on discussions of this data we discussed that our core courses have sufficient work on written communication, but that oral communication was only assessed in senior seminar. We talked about the possibility of including presentations in our core courses, but there were no commitments made about revising courses to included presentations. We also decided that future assessments would not necessarily include rubrics for oral presentations core courses but instead that we would consider whether it's plausible to integrate presentations in core courses.

Attached to this Report:

Spring 2023 Assessment Meeting Agenda
Assessment of Seniors 2023 (direct assessment)
LG Senior Survey (indirect assessment)

Appendix 1

STUDY OF THE MIND / NEUROSCIENCE LEARNING GOALS

Upon completion of the requirements for the major in The Study of the Mind and the Minor in Neuroscience, students will:

1. Understand, explain, predict, and model the relationships between the brain and nervous system, cognition, behavior, and the environment.
2. Rigorously apply the scientific method to questions that arise from the study of the mind and brain.
3. Gain foundational knowledge from philosophy, psychology, biology, and computer science.
4. Integrate the concepts, principles, and methods from multiple disciplines pertinent to the study of the mind.
5. Demonstrate critical reading and thinking skills that allow students to assess and contextualize interdisciplinary literature in the study of the mind and neuroscience.
6. Demonstrate an understanding of the ethical issues in the field of study of the mind and neuroscience and the approaches researchers use to confront them.
7. Demonstrate competency in oral and written scientific communication skills.

Appendix 2

THE STUDY OF THE MIND / NEUROSCIENCE PROGRAM ASSESSMENT PLAN

The Study of the Mind Assessment Plan

Upon completion of the requirements for the major in The Study of the Mind and the Minor in Neuroscience, students will:

1. Understand, explain, predict, and model the relationships between the brain and nervous system, cognition, behavior, and the environment.
2. Rigorously apply the scientific method to questions that arise from the study of the mind and brain.
3. Gain foundational knowledge from philosophy, psychology, biology, and computer science.
4. Integrate the concepts, principles, and methods from multiple disciplines pertinent to the study of the mind.
5. Demonstrate critical reading and thinking skills that allow students to assess and contextualize interdisciplinary literature in the study of the mind and neuroscience.
6. Demonstrate an understanding of the ethical issues in the field of study of the mind and neuroscience and the approaches researchers use to confront them.
7. Demonstrate competency in oral and written scientific communication skills.

CURRICULUM MAPPING (See Also Appendix A)

NEUROSCIENCE MAJOR

Course	LG1	LG2	LG3	LG4	LG5	LG6	LG7
BIOL 150		I	I				I
CSCI 150	I		I				
PSYC 220	I	D	I (from biology and psychology, but not the others; although those disciplines are *introduced*, they are not substantial parts of the course)				
Statistics		D		I			
PHIL 350	D	I theoretical	D	I	M	I	M
PHIL 390	D	I theoretical	D	M	M	I	M
BIOL 325	M	D	D	D (mainly biology, chemistry, and physics)	D	I	D
NEUR 497				M		M	
4 electives	D	D	D	D	D	D	D

NEUROSCIENCE MINOR

Course	LG1	LG2	LG3	LG4	LG5	LG6	LG7
BIOL 150		I	I				I
PSYC 220	I	D	I (from biology and psychology, but not the others; although those disciplines are *introduced*, they are not substantial parts of the course)				
BIOL 325	M	D	D	D	D	I	D
PHIL 390	D	I theoretical	D	M	M	I	M
2 electives	D	D	D	D	D	D	D

LEARNING GOAL 1

Understand, explain, predict, and model the relationships between the brain and nervous system, cognition, behavior, and the environment.

Direct Assessment— Rubric for assessment of major assignment— midterm, final, or course paper— that focuses on foundations from the following courses: PSYC 220 Brain and Behavior, CSCI 150 Foundations of Computer Science, PHIL 350 Philosophy of Mind, PHIL 390 Philosophy of Science, and BIOL 325 Neurobiology. Classroom teachers for each of these courses will identify 2 key questions that reflect the most important concepts that students should retain from the core courses. Each of these key questions should appear in an existing assessment instrument, such as a midterm, comprehensive final exam, or course paper. For each key question data will be collected on: 1) The text of the question; 2) The scoring rubric for the question; 3) The mean student score for the question.
and Capstone Thesis Rubric RLG1.

Indirect Assessment— The student perspective provided in the Neuroscience Senior Survey question 5.1.

LEARNING GOAL 2

Rigorously apply the scientific method to questions that arise from the study of the mind and brain.

Direct Assessment— Capstone Thesis Rubric R4 and R5 and Capstone Thesis Rubric RLG2

Indirect Assessment— The student perspective provided in the Neuroscience Senior Survey question 5.2.

Future assessment goals may include using a faculty-developed rubric for Statistics, Brain and Behavior, or Philosophy of Science to assess the use of the scientific method and specific techniques in select courses.

LEARNING GOAL 3

Gain foundational knowledge from philosophy, psychology, biology, and computer science

Direct Assessment— Capstone Thesis Rubric R3 and Capstone Thesis Rubric RLG3 and rubric for assessment of major assignment— midterm, final, or course paper— that focuses on foundations from the following courses: PSYC 220 Brain and Behavior, CSCI 150 Foundations of Computer Science, PHIL 350 Philosophy of Mind, PHIL 390 Philosophy of Science, and BIOL 325 Neurobiology. Classroom teachers for each of these courses will identify 2 key questions that the foundational knowledge gained from the core courses.

Indirect Assessment— The student perspective provided in the Neuroscience Senior Survey question 5.3.

LEARNING GOAL 4

Integrate the concepts, principles, and methods from multiple disciplines pertinent to the study of the mind.

Direct Assessment— Capstone Thesis Rubric R9 and RLG4 and Rubric from Interdisciplinary Senior Seminar paper

Indirect Assessment— The student perspective provided in the Neuroscience Senior Survey question 5.4.

Future assessment goals may include using faculty-developed rubrics for interdisciplinary components of core courses.

LEARNING GOAL 5

Demonstrate critical reading and thinking skills that allow students to assess and contextualize interdisciplinary literature in the study of the mind and neuroscience.

Direct Assessment— Capstone Thesis Rubric R1, R3, R6 and RLG5

Indirect Assessment— The student perspective provided in the Neuroscience Senior Survey question 5.5.

Future assessment goals may include rubrics for methods components or rubrics for literature reviews in core courses.

LEARNING GOAL 6

Demonstrate an understanding of the ethical issues in the field of study of the mind and neuroscience and the approaches researchers use to confront them.

Direct Assessment— Certificates of completion of either the human subjects or animal subjects training course offered by the NIH Office of Extramural and Intramural Research, respectively. These will be conducted as part of the capstone course.

- Human subjects course: https://phrp.nihtraining.com/index.php
  - Topics: codes and regulations, respect for persons, beneficence and justice
- Animal subjects course: https://oacutraining.od.nih.gov/public_menu.aspx
  - Topics: animal care and use policies, occupational health and safety, animal health and well-being, animal care and use procedures

Indirect Assessment— The student perspective provided in the Neuroscience Senior Survey question 5.6.

LEARNING GOAL 7

Demonstrate competency in oral and written scientific communication skills.

Direct Assessment— Capstone Thesis Rubric R2, R7, and R8 and RLG7 and Rubric from science communication Senior Seminar paper

Indirect Assessment— The student perspective provided in the Neuroscience Senior Survey question 5.7.

Future assessments may include rubrics for oral presentations and course papers in core courses.

Appendix 3

The Study of the Mind Capstone Rubric
2021-2022

Student Name:

Faculty Evaluator Name:

Category	Basic	Competent	Exemplary	Score
R1: Thesis Statement & Title	•Topic is not identifiable, statement is vague, does not take a position, is too broad, or is not debatable. •Title does not identify or agree with the thesis statement.	•Thesis statement is clearly identifiable, but may be too broad or does not take a position on the topic.	•Thesis statement is clearly identifiable, debatable, specific, and takes a clear position on the topic. The title identifies the thesis statement.	/5
R2: Abstract	•No abstract present or does not provide insight into thesis, argument or methodology •Significantly exceeds word limit.	•Abstract present yet and provides basic overview of the topic. •Abstract missing one of the following: thesis (purpose), argument (context), or methodology (content).	•Concisely answers the "what?" "why?" "how?" and "to what end?" •Describes context, purpose, and content. •Engages the reader. •<250 words.	/10
R3: Introduction & Background	•The research question is not clearly articulated. •Does not connect to the "big picture." •Too technical for lay reader to follow.	•The research question is identified, but not supported by context or significance. •Ambiguous or brief understanding of	•States the research question, and its context and significance. •Demonstrates complete, clear and accurate	/10

	• Does not define critical terms. • Is incompletely and/or inaccurately referenced.	the "big picture" demonstrated. • Most fundamental concepts and critical terms are described. • Mostly accurate and complete referencing.	understanding of the "big picture." • Includes well-organized description of basic knowledge necessary to follow content and arguments within the thesis. • Critical terms and abbreviations are defined. Completely and accurately referenced.	

R4: Analysis	•No synthesis or analysis of information presented. •Supporting information is noticeably one-sided. •Evidence is not presented to support major claims/arguments.	•Some synthesis and analysis of information from multiple sources and perspectives is evident. •Evidence is presented to support major claims/arguments, but is not critically assessed.	•Creatively synthesizes and compares/contrasts relevant information from multiple primary sources. •Critically and accurately assesses information presented. •Evidence/data from primary literature is used to support major claims/arguments.	/10
R5: Argument & Reasoning	•Arguments are not supported by evidence/data. •Argument does not support the thesis statement and/or conclusions presented. •Argument contains false information. •The conclusion of the argument does not agree with the goal of the argument.	•Most arguments are sensible and support the thesis statement, but do not completely convince the reader due to lack of evidence to support claims.	•Major arguments presented are supported by evidence/data. •All arguments are accurate and support the thesis statement. •The conclusion of the argument is relevant to the goal of the argument.	/10
R6: Summary & Conclusions	•Conclusions are unoriginal and/or are not supported by the arguments and evidence presented in the paper. •Limitations, significance, and feasibility of position presented not addressed.	•Conclusions are not novel, yet provide additional insight on the topic based on a reasoned assessment of the information presented. •Feasibility of individual contribution and future directions not fully addressed.	•Creates and defends a new position based on a reasoned assessment of the information presented. •Presents significance and limitations of conclusions. •Presents future directions that are salient, plausible and insightful.	/10

R7: Writing Clarity & Organization	•Paper contains excessively long sentences or paragraphs, undefined obscure terms or concepts, confusing sentences, erratic paragraphs, and/or no headings/subheadings . •Few transitions used to aid information flow from one point to another. •Organization exhibits consequences of inadequate active planning for the clarity and organization of the presented material.	•Most key concepts and terms are clearly defined. •Organization is somewhat choppy, but not erratic. •Most sections differentiated by headings/subheadings and connected by transitionary statements. •Some active organizational planning is evident.	•Carefully edited and proof-read. •Sentence and paragraph structure clear and well-organized. •Informative subheadings that aid comprehension and organization. •An organizational strategy illustrating evidence of active planning for presenting information clearly and effectively •Effective transitions to aid flow of information from one main point to another. •All key concepts and disciplinary language are clearly defined.	/10
R8: Writing Mechanics & Grammar	•Paper does not meet specifications of required formatting. •Many grammar and spelling errors. •Paper does not meet the minimum required number of pages (25). •References not cited in correct format.	•Most formatting requirements are met. •Only a few grammar or spelling mistakes observed. •Some references show inconsistencies in referencing style.	•Double spaced, 12 pt font, 1 inch margins, page numbers. •Correct grammar and spelling. •Meets paper length requirements (>15 pp.) •References cited correctly in Chicago style (in-text and bibliography).	/10
R9: Interdisciplinarity & Accessibility	•The argument is based on a single disciplinary perspective. Is only	•A few different disciplinary perspectives are used to support the thesis.	•The argument includes philosophical, psychological, biological, and	/5

	accessible to disciplinary experts.	Is accessible to most readers.	computer scientific perspectives and is accessible to all readers	
R10: Originality & Creativity	•The topic, thesis, idea, or central argument is not original nor creative and is exactly the same as views discussed in sources.	•A few ideas and arguments are original, but many are similar to views discussed in sources.	•The topic, thesis, idea, or central argument is original and creative, and thus differs significantly from views discussed in sources.	/5
R11: **1st Reader Discretionary Points - Individual Growth/Work with Mentor	•Student did not advance any skills throughout writing and communication process •Did not work with mentor and/or did not keep appointments	•Student showed some advancements in writing and communication during the thesis process •Incorporated mentor feedback but rarely engaged with mentor	•Student exhibited tremendous growth in writing, professional, and/or communication skills •Worked closely with mentor, attended regular meetings, incorporated feedback	/15
		SubTotal		**/100**
		*Late Penalty (10%/week)	-	%
		Total		**/100**

* Thesis presentation will not be scheduled unless final paper has been submitted.

**1st Reader discretionary points are only to be scored by the primary thesis adviser, in consultation with the 2nd reader

Comments to Author:

Briefly identify the strengths of the thesis:

Briefly identify the weaknesses of the thesis:

RLGs: The below assessment serves the purpose of assessing the Study of the Mind / Neuroscience program learning goals and should not be factored into the capstone thesis grade. Please identify the extent to which you feel this thesis indicates that the student as achieved each of the following Study of the Mind / Neuroscience Learning Goals.
1 = Has not achieved and 5 = Achieved to a high degree, ND = I cannot determine from the information presented in the thesis.

Learning Goal	1	2	3	4	5	ND
RLG1: Understand, explain, predict, and model the relationships between the brain and nervous system, cognition, behavior, and the environment.						
RLG2: Rigorously apply the scientific method to questions that arise from the study of the mind and brain.						
RLG3: Gain foundational knowledge from philosophy, psychology, biology, and computer science						
RLG4: Integrate the concepts, principles, and methods from multiple disciplines pertinent to the study of the mind.						
RLG5: Demonstrate critical reading and thinking skills that allow students to assess and contextualize interdisciplinary literature in the study of the mind and neuroscience.						
RLG6: Demonstrate an understanding of the ethical issues in the field of study of the mind and neuroscience and the approaches researchers use to confront them.						
RLG7: Demonstrate competency in oral and written scientific communication skills.						

Appendix 4

Catalog Description for the Study of the Mind / Neuroscience Major and Minor

The Study of the Mind Major

12 courses distributed as follows:

BIOL 150 *Cell Biology*
CSCI 150 *Foundations of Computer Science*
PSYC 220 *Brain and Behavior*
PSYC 290 *Statistics*
or

MATH 215 *Statistical Analysis*
or
BUSI 250 *Principles of Statistics*
or
SOCI 210 *Social Statistics*
PHIL 350 *Philosophy of Science (W2)*
PHIL 390 *Philosophy of Mind (W2)*
BIOL 325 *Neurobiology*
NEUR 497 *Neuroscience Senior Capstone*

Four electives from the following list, no more than two of which can be from the same discipline as identified by its four-letter code and at least two of which at the 300 and above level:

BIOL/PSYC 300 *Comparative Animal Behavior*
BIOL 250 *Genetics*
BIOL 310 *Developmental Biology*
BIOL 320 *Animal Physiology*
BIOL 355 *Advanced Cell Biology*
BIOL 430 *Immunology*
BIOL 470 *Advanced Genetics*
CHEM 110 *General Chemistry I*
CSCI 151 *Data Structures and Object-Oriented Development*
CSCI 235 *Intelligent Robotics*
CSCI 270 *Computational Humanities*
CSCI 285 *Scientific Computing*
CSCI 335 *Artificial Intelligence*
PHIL 245 *Introduction to Logic*
PHIL 235 *Philosophy of Cognitive Science*
PHIL 280 *Free Will, Agents, and Intentions*
PHIL 420 *Neurophilosophy (W2)*
PSYC 295 *Research Methods (w/Lab)*
PSYC 310 *Social Neuroscience*
PSYC 320 *Cognitive Psychology*
PSYC 335 *Sensation and Perception*
PSYC 355 *Evolutionary Psychology*
PSYC 360 *Behavioral Neuroscience*

The Neuroscience Minor

Minor in Neuroscience

Students may not declare a Neuroscience minor if they have declared a major in the Study of the Mind.

6 courses distributed as follows:

BIOL 150 *Cell Biology (w/Lab)*
PSYC 220 *Brain and Behavior*

BIOL 325 *Neurobiology*
PHIL 390 *Philosophy of Mind (W2)*

Two electives from the following list from two different disciplines as identified by its four-letter code:

BIOL/PSYC 300 *Comparative Animal Behavior*
BIOL 320 *Animal Physiology*
PHIL 235 *Philosophy of Cognitive Science*
PHIL 350 *Philosophy of Science (W2)*
PHIL 420 *Neurophilosophy (W2)*
PSYC 310 *Social Neuroscience*
PSYC 335 *Sensation and Perception*
PSYC 360 *Behavioral Neuroscience*

Learning goals for Major and Minor

1. Understand, explain, predict, and model the relationships between the brain and nervous system, cognition, behavior, and the environment.
2. Rigorously apply the scientific method to questions that arise from the study of the mind and brain.
3. Gain foundational knowledge from philosophy, psychology, biology, and computer science.
4. Integrate the concepts, principles, and methods from multiple disciplines pertinent to the study of the mind.
5. Demonstrate critical reading and thinking skills that allow students to assess and contextualize interdisciplinary literature in the study of the mind and neuroscience.
6. Demonstrate an understanding of the ethical issues in the field of study of the mind and neuroscience and the approaches researchers use to confront them.
7. Demonstrate competency in oral and written scientific communication skills.