Neuroscience Studies Major
Revised Assessment Plan
January, 2014

I. Learning Statement

The goal of the neuroscience studies major at Macalester College is to enable the student to study the nervous system from a variety of perspectives and methodologies based on the student's own interests in this field. Neuroscience as a field of study encompasses examination of the evolution, development, structure (both physical and organizational, as in artificial intelligence, computational and theoretical modeling), functions (including adaptive mechanisms, cognitive, systems, and philosophical approaches), pharmacology, clinical assessment, and pathology of nervous systems in order to further understand how thought and behavior develop, are organized, and maintained. To accomplish this goal, the Neuroscience Studies major provides a broad multidisciplinary introduction to the study of the brain, mind and behavior coupled to focused, student-interest driven advanced inquiry derived from select coursework in contributing disciplines/departments at Macalester College. This advanced inquiry can take the form of dedicated emphases of courses, approved majors or minors in other disciplines at the college. In this way, the neuroscience studies major prepares students for successful graduate education in the neurosciences and promotes the skills and knowledge needed for students to become lifelong learners.

II. Department Learning Goals and Outcomes

Goal 1:
Students will become broadly knowledgeable about the scientific study of the physical nature of the nervous system and the mechanisms of thought and behavior in humans and other animals.

Outcome 1:
Students will demonstrate knowledge of fundamental principles in neuroscience, including key concepts from across the range of information considered in the study of the nervous system.

Goal 2:
Students will understand the methods, conceptual analysis, applications, and means of communication most common in neuroscience.

Outcome 2: Students will demonstrate an understanding of a variety of methods common in neuroscience, and their strengths and weaknesses.

Outcome 3: Students will demonstrate the skills required to make informed methodological decisions in the context of their own research projects.

Outcome 4: Students will demonstrate an understanding of the dynamic and interdependent relationship between empirical results and theory development.

Outcome 5: Students will demonstrate the skills required to communicate effectively by writing in APA and other relevant styles, and presenting orally in conference and classroom settings.

Goal 3:
Students will demonstrate mastery of the specific theories and methodologies in an associated contributing discipline.

Outcome 6: Students will demonstrate both a mastery of the key concepts, findings, methodologies, and controversies in an associated contributing discipline, and the ability to critique and synthesize that scholarship.

Goal 4:
Students will appreciate the relationship of neuroscience to other academic disciplines by examining its philosophical, social, computational and natural science dimensions.

Outcome 7: Students will demonstrate a greater awareness of the intersection of neuroscience with other ways of knowing about the nature of the nervous system, behavior and thought.

III. Assessment Strategies

Outcome 1: Students will demonstrate knowledge of fundamental principles in neuroscience, including key concepts from across the range of information considered in the study of the nervous system.

Assessed early in the college major experience and in senior year as part of the structure of the community outreach programs administered by the neuroscience studies program. All students enrolled in NEUR/PSYC 180, Brain Mind and Behavior participate in the Kids Judge! neuroscience fair (Fall semesters) or the Brain Awareness Week (Spring semesters) each year. These events require students to design and implement basic lessons in neuroscience concepts that are delivered to members of the greater community, who also complete evaluations of the lesson on completion. Senior neuroscience studies majors are also involved in each of these events, serving as resources for information and advisors to the introductory students. I the case of Brain Awareness Week, the NEUR 488 course is tasked with the complete oversight of a week of neuroscience-related events, each component of which is subjected to evaluation by participants.

Outcome 2: Students will demonstrate an understanding of a variety of methods common in neuroscience, and their strengths and weaknesses.

Assessed in senior year through the Brain Awareness Week activities, and as part of in-course assessments throughout the major. The Directed Research course, NEUR 300 is also used to assess this understanding through the requirement of multiple drafts of extensive theoretical and methodological literature reviews associated with the completion of the student's own research study. For many students, the option of completing one or more (up to 4) semesters of NEUR 602: Research Methodology Tutorial will also be a source of assessment, as modules in the methodology are assessed by strict rubric for satisfactory completion of skill acquisition and theoretical basis. All data on each student's progress will be stored online in spreadsheet format, creating ePortfolios of their advances in skill and understanding.

Outcome 3: Students will demonstrate the skills required to make informed methodological decisions in the context of their own research projects.

This process parallels the process used in the other major housed in the Psychology Department—it is assessed through the rubric applied to Directed Research papers.

Outcome 4: Students will demonstrate an understanding of the dynamic and interdependent relationship between empirical results and theory development.

Assessed through the rubric applied to Directed Research papers.

Outcome 5: Students will demonstrate the skills required to communicate effectively by writing in APA and other relevant styles, and presenting orally in conference and classroom settings.

Assessed through rubric applied to the NEUR 488 Senior seminar and to the required oral presentation of Directed Research project at a national, regional or statewide research conference.

Outcome 6: Students will demonstrate both a mastery of the key concepts, findings, methodologies, and controversies in an associated contributing discipline, and the ability to critique and synthesize that scholarship, both separate from, and in relation to the neuroscience literature.

Assessed by rubric and students assignment applied to the NEUR 300 course and directed research final paper and to the required oral presentation of that project to the members of the NEUR 488 course (each student participates in peer review and completes summary evaluations of others' talks using rubric).

Outcome 7: Students will demonstrate a greater awareness of the intersection of neuroscience with other ways of knowing about the nature of the nervous system, behavior and thought.

Assessed by rubric applied to exit interview questions addressed to all students each year. Also assessed by the completion of the directed research project and paper in NEUR 300.

IV. Four-Year Timeline to Implement Assessment Strategies

2014

Our Spring 2014 assessments will include exit interviews with all seniors, the Brain Awareness Week assignment, and NEUR 488 presentations for exiting seniors. In Fall 2014 we will complete the Kids Judge! Neuroscience fair assignment and assessments, and all seniors will present their directed research projects at the regional neuroscience research conference, MidBrains. Students completing the NEUR 300 course in either semester will be assessed for multiple outcomes using the rubric.

2015

Our Spring 2015 assessments will include exit interviews with all seniors, the Brain Awareness Week assignment, and NEUR 488 presentations for exiting seniors. In Fall 2014 we will complete the Kids Judge! Neuroscience fair assignment and assessments, and all seniors will present their directed research projects at the regional neuroscience research conference, MidBrains. Students completing the NEUR 300 course in either semester will be assessed for multiple outcomes using the rubric. All student ePortfolios derived from participation in the NEUR 602 course to date will be examined for average completion rates, common trends in achievement, and areas requiring further development.

2016

Our Spring 2015 assessments will include exit interviews with all seniors, the Brain Awareness Week assignment, and NEUR 488 presentations for exiting seniors. In Fall 2014 we will complete the Kids Judge! Neuroscience fair assignment and assessments, and all seniors will present their directed research projects at the regional neuroscience research conference, MidBrains. Students completing the NEUR 300 course in either semester will be assessed for multiple outcomes using the rubric. A review of all directed research project papers for the most recent 3 years will be conducted to direct revision of the rubric and adjustments in pedagogy related to this central feature of the major.

2017

Our Spring 2015 assessments will include exit interviews with all seniors, the Brain Awareness Week assignment, and NEUR 488 presentations for exiting seniors. In Fall 2014 we will complete the Kids Judge! Neuroscience fair assignment and assessments, and all seniors will present their directed research projects at the regional neuroscience research conference, MidBrains. Students completing the NEUR 300 course in either semester will be assessed for multiple outcomes using the rubric. As in 2015, all student ePortfolios derived from participation in the NEUR 602 course to date will be examined

for average completion rates, common trends in achievement, and areas requiring further development.

Responsibilities

The Director of Neuroscience Studies will work with the Psychology department coordinator and laboratory instructor to maintain assessment records, NERU 602 ePortfolios, and copies of students Directed Research paper. As with the psychology major, responsibilities for revising and applying the rubrics will be shared among faculty with particular expertise in the relevant goal area.