LEARNING OUTCOMES: NEUROSCIENCE, PHD

Learning Outcomes for the degree of Doctor of Philosophy in Neuroscience

1. **Knowledge of chosen research area:** Students are expected to be acquainted with the full breadth of neuroscience research, but for assessment purposes, each student chooses one major and two minor areas of concentration that form the core of their professional knowledge and are tested on the Qualifying Exam. We believe neuroscience is too broad for every student to master the same core knowledge and be successful; instead, students plan their own programs of study (with committee guidance) and develop independence in building their expertise.

2. **Mastery of experimental design and methods:** Students plan, design, carry out and interpret experiments; they are expected to be fully competent in the standard techniques of their field and to learn cutting-edge techniques where possible.

3. **Analytical and quantitative skills:** All students are encouraged to take statistics courses appropriate to their research area and to become experts in the treatment, analysis, and interpretation of data. Most students learn to code their own data management and statistical procedures.

4. **Writing and presentation skills:** All students must demonstrate strong skills in writing manuscripts for publication and grant proposals, and in giving oral presentations. Students are expected to communicate their research effectively to general scientific and to lay audiences.

5. **Teaching and mentoring:** Students are required to be Teaching Assistants for one semester at 50% (or two semesters at 25%). Some students are able to petition the program to waive the teaching requirement if they can demonstrate equivalent preparation time and direct contact time with another group of students. Most students mentor one or more undergraduate students, or more junior graduate students, during their time in the program.

6. **Professional skills and ethics:** The program requires completion of a course in Professional Skills and Ethics that covers career planning, grant writing and review, oral presentations, time management, different career stages (postdoc, junior faculty, tenured professor) and non-academic careers, and an introduction to research and professional ethics. Additional required workshops cover standard Responsible Conduct of Research topics mandated by NIH and NSF. We are in the process of requiring completion of this training prior to the Qualifying Exam.

7. **Citizenship and organizational skills:** Students are expected to have strong interpersonal and collegial skills for collaborations, networking, etc. Neuroscience students have an exceptional culture of participation, volunteering and organizing program events, including our Brain Awareness Day (annual public outreach event) and Open House for visiting recruits. The skills acquired in these experiences are not “scientific”, but they have a major impact on students’ effectiveness in their varied roles and in the impression they make on visitors to the program and the university.