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I. GENERAL INFORMATION

I. A. Graduate School requirements [modified from the catalog of the Graduate School]

I. A.1. Degree requirements
Students undertaking work for the degree of Doctor of Philosophy should understand that this degree is awarded not for an accumulation of course credits only, but for superior attainment and accomplishment, including the performance of an original research project. Ordinarily the student is expected to finish the course requirements in two full years of graduate study and complete the dissertation by the fourth year. The student must demonstrate independent study and research, as evidenced in the dissertation, the ability to carry out an original investigation in the chosen field. A minimum of one year full-time study in residence at Tulane University is required. The minimum course requirements are 48 semester hours. Students must complete the requirements for the Ph.D. degree within seven years from the date of matriculation in the School of Science and Engineering Graduate Program. Only in unusual cases, with the approval of the Steering Committee and SSE Graduate Program, will approval be granted for an extension of this period beyond seven years.

I. A. 2. Transfer of credits
Acceptance of graduate credit for work done at other graduate institutions or in another division of Tulane University must be approved by the Steering Committee and by the SSE Graduate Program. In general, up to 24 semester hours of transfer credit may be accepted toward the Ph.D. degree. To be considered for transfer credit, graduate work done at another institution or in another division of Tulane University must carry a grade of B or better and must have been completed no more than six years from the date of first registration for graduate work applied toward a Ph.D. degree. Only in unusual cases, with the approval of the Steering Committee and SSE Graduate Program, will credit be approved for courses taken more than six years before first registration for graduate work. The decision concerning the acceptance of all transfer of credit to the record of a graduate student will not be reached until after the student has completed at least one semester of successful study in the Graduate Program. After a semester (nine hours) of study at Tulane, the student should petition the Program to recommend transfer credit to the Graduate School.

I. A. 3. Continuous registration requirements
A student admitted to the SSE Graduate Program in a degree program must be in continuous registration in a degree-granting division of the University until the awarding of the degree. Any student who is not registered for course work in a degree-granting division of the University must be registered in Dissertation Research in order to remain in continuous registration. The continuous registration requirement applies both to resident and non-resident students. Resident or non-resident students who have completed their course work requirements are required to register for Dissertation Research (9990) (no credit hours) in order to maintain continuous registration. This entitles students to full student privileges. Failure to be so registered is de facto withdrawal and the SSE Graduate Program reserves the right not to readmit. A student who is readmitted is obligated to pay the applicable fee required to maintain continuous registration.
I. A. 4. Performance standards
A minimum average quality-point ratio of 3.0 (B) must be maintained by a student in the SSE Graduate Program. In reviewing records, a unit of B- is compensated by a unit of B+, the two being considered the equivalent of two units of B. If a student receives one B- grade, the student is immediately considered for probation by the SSE Graduate Dean in consultation with the Steering Committee. If a student receives two grades of B- or one grade less than B- during his/her tenure in the SSE Graduate Program, the student is placed on probation and considered for dismissal by the SSE Graduate Dean in consultation with Steering Committee. The terms of the probation are to be worked out by the Steering Committee in consultation with the SSE Graduate Dean. It is the Program Director’s responsibility to report to the SSE Graduate Dean’s office any student not making reasonable progress towards the degree. The above guidelines are to be applied to either master or doctoral degree candidates. It is also understood that these are minimum standards; some departments or programs may impose more strenuous standards. University procedures for grade and other academic complaints are available in the SSE Graduate Program office. The student must first discuss the complaint with the professor, then, if dissatisfied, submit a written complaint to the department chair or Program Director.

I. A. 5. Honor Code
The SSE Graduate Program expects students to conduct their academic endeavors with honesty and integrity. Activities covered by the following Honor Code include course work, examinations, and research. This Honor Code outlines individual responsibilities as well as procedures to be followed if there is a question concerning a student’s academic honesty or integrity. These values are held in common by all departments and enforced by the sanctions of the Dean of the SSE Graduate Program. All students enrolled in the SSE Graduate Program are subject to these regulations and should be familiar with this Honor Code. A copy of the Honor Code is available in the Graduate School office. Principles and activities not covered by this Honor Code may fall under the purview of university or departmental research and/or ethics committees. Questions concerning jurisdiction should be addressed to the Dean of the Graduate School.

I. A. 6. Code of Student Conduct
The University requires of all of its students behavior compatible with its high standards of scholarship and conduct. The Vice President for Student Affairs is responsible for formulating appropriate procedures and regulations concerning student behavior and for the judicial consideration of violations. A copy of the Code of Student Conduct is available in the Office of Student Affairs and in the SSE Graduate Program office.

I. A. 7. Required withdrawal and denial of enrollment
A student may be required to withdraw from any course or from the University, temporarily or permanently, for any of the following reasons:
1. Work below the standard specified by the college in which the student is enrolled.
2. Violation of the honor system or other misconduct.
3. Possibility of danger to the health of the student or to other students if enrollment is continued.

The University reserves the right to forbid any student’s continued enrollment without assignment of reason. The SSE Graduate office, however, will provide a student with a statement of reason in writing from the department or program. An appellate procedure has been established in cases involving academic performance or possible infringement of academic
freedom. The SSE Graduate Program also has appellate procedures in cases involving non-reappointment of fellowships or scholarships when the formal terms of the first award have given reasonable expectation of renewal. Such procedures may also apply to cases in which a graduate, teaching, or research assistant, is relieved of a position before the end of the term of the appointment or is not reappointed when the formal terms of the first appointment have given reasonable expectation of reappointment. Copies of these procedures are available in the SSE Graduate Program office. Resignation from the SSE Graduate Program must be made in writing to the Dean of the SSE Graduate Program. The student who finds it necessary to withdraw or to resign should report to the SSE Graduate office to complete a withdrawal or resignation form.

I. B. Leave time

I. B. 1. Holidays
Students are eligible for holidays as described in the University Calendar. However, students should be aware that the Medical School and the SSE Graduate Program operate on different calendars, so graduate students enrolled for coursework in the Medical School may have to adjust their holiday schedules accordingly.

I. B. 2. Vacation
Students are eligible for two weeks of vacation per year. The summer session during graduate school should be time spent in residence and is not a vacation or holiday period.

I. B. 3. Leave of absence
Students may apply for a leave of absence if more than two weeks of leave time is required. Leaves of absence are generally uncompensated [i.e., without stipend support] unless extraordinary circumstances prevail. Leaves of absence must be approved by the Steering Committee and the student’s advisor.

I. C. Financial support

I. C. 1. Institutional support is provided for a limited period of time [either 2 years or 4 years, depending on the source; see below]. Students should consult with their advisors early in the second year to determine the source of further support for the student.

Stipends may be provided by the Louisiana Board of Regents Support Fund for Superior Graduate Students, which support extends for 4 years. Support beyond the fourth year must be obtained from extra-institutional sources.

Stipends are provided by the School of Science and Engineering and the Health Sciences Center. Students may be supported by a teaching assistantship during the first two years of study. Support beyond the second year must be obtained from extra-institutional sources.

Teaching Assistantships require the student to participate in teaching of undergraduates on the Uptown Campus. The time commitment involved in this varies depending on which course the graduate student is assisting with. TA-ships may extend for more than one year.
Tuition waivers are available for all students who are receiving stipend support or who have TA-ships.

I. C. 2. Extra-institutional support may be obtained by the student in collaboration with the advisor, or by the advisor on behalf of the student.

Pre-doctoral fellowship support for students may be obtained by application to different funding agencies, including several of the NIH institutes [via the F31 award mechanism – the individual National Research Service Award], the American Psychological Association, Merck/UNCF, etc. Information on application for these awards is available from the above organizations or institutes, via their websites [www.nih.gov; www.apa.org; www.uncf.org]. These are competitive awards that may require more than one submission to achieve success. Students are thus advised to begin the application process early in the second year in order to obtain funding by the third year. The National Science Foundation also awards individual pre-doctoral fellowships, which are highly competitive and must be applied for during the fall semester of the first year of graduate school [www.nsf.gov].

Support for students may also be provided by the student’s advisor, usually through the advisor’s granting agency.

I. C. 3. Outside employment: Because of the intensive nature of graduate training at the doctoral level, outside employment is discouraged. However, should the student feel this to be necessary due to extenuating circumstances, the student should first obtain approval from the student’s advisor and the Steering Committee.

II. CURRICULUM

II. A. General requirements. 48 hours of course credits are required for the Ph.D. Up to 12 of these hours may be satisfied by registration for NSIP 7980, Neuroscience Research. The remaining 36 hours must be divided between core and elective curriculum.

II. B. Core curriculum

This includes courses that are required of all students, and comprises 18 of the 48 credit hours required for the Ph.D.

**Graduate Neuroscience NSCI 7110, [3]**. Offered in the fall, this course covers the basic principles of neuroscience at the graduate level, including neurophysiology, cellular and molecular neurobiology, developmental neurobiology, systems neurobiology, and plasticity. [Note: M.D./PhD. students may substitute NSIP 602, Medical Neuroscience, [6], for Graduate Neuroscience.]

**Methods in Neuroscience, NSCI 6150/6155 [4]**. Offered in the fall, this course exposes students to contemporary theories and techniques used by Tulane neuroscientists in their own research programs. The course is taught by faculty members representing several departments from both the Main Campus and the Health Sciences Center. Co requisite: NSCI 6155. A laboratory course allowing students to follow a neuroscience experiment from hypothesis-design development to neurochemical analyses. The course provides direct exposure to drug administration, behavioral assessment, tissue preparation, and in vitro analysis of neurochemicals.
**Trends in Neuroscience, NSCI 6040 [1]**. Offered every semester, this course is designed to provide the student with the ability to critically read and interpret the current scientific literature and to present and discuss research (with their peers). Students must register for Trends every semester for the first two years.

**Neuroscience Seminar, NSCI 6030 [1]**. Offered every semester, this seminar series is designed to provide the student with exposure to current faculty and student research at Tulane, as well as research by visiting scientists and others in the local neuroscience community. Students will receive credit for Seminar for the first two years, but is expected to attend through graduation.

**Responsible Conduct of Research, MSCR 6420**. This course is offered in the summer and is required of all students.

**Univariate I, PSYC 6090 [3]**. Offered every fall, this course will cover selected topics relating to methodological or quantitative aspects of psychological research are examined. Examples of topics include non-parametric statistics, computer applications in mathematical models of behavior, problems in design of multivariate analyses, Monte Carlo solutions to quantitative problems, and least-squares approaches.

**Teaching requirement**. Students supported by a TAship will assist with teaching of undergraduate neuroscience courses.

**II. C. Electives**

Graduate course credit can be obtained only for courses with numbers above 600. Students should consult departmental and program websites for other electives of potential interest.

**II. C. 1. Neuroscience electives.**

- **Molecular Neurobiology.** NSCI 6370 [3], fall semester.
- **Cellular Neuroscience.** NSCI 6310 [3], fall semester. Dr. Jeff Tasker.
- **Univariate II.** PSYC 6110 [3], spring semester. Prerequisite: **Univariate I**. Dr. Dave Corey
- **Behavioral Endocrinology.** NSCI 6060 (3), spring semester. Prerequisite: PSYC 3300 [Brain and Behavior] or instructor approval. Drs. Gary Dohanich/Beth Wee.
- **Biological Psychology.** NSCI 6510 [3], spring semester. Prerequisite: a course in Psychobiology or instructor approval. Dr. Paul Colombo.
- **Psychopharmacology.** NSCI 6530 [3], fall semester. Prerequisite: a course in Psychobiology or instructor approval. Dr. Gary Dohanich.
- **Cognitive Neuroscience.** NSCI 6570 [3], spring semester. Prerequisite: PSYC 611 [Intermediate Statistics and Experimental Design]. Dr. Ed Golob.
- **Developmental Neurobiology.** NSCI 6350 [3], spring semester.
- **Neurobiology of Learning & Memory.** NSCI 6333 [3], fall semester. Dr. Jill Daniel.

**III. PROGRESS TOWARD THE DEGREE**

**III. A. Advising**

**III. A. 1. The temporary advisor**

First-year students will be assigned a temporary advisor by the Steering Committee. First year students should meet with the temporary advisor on a regular basis, and should consult with the temporary advisor on issues such as registration for coursework, scheduling research rotations, etc. First year students are especially urged to consult with the temporary advisor in the event of any academic difficulties that may occur.
III. A. 2. Choosing a permanent advisor
Selection of an advisor is usually made when the research rotations have been completed [see below]. Thus, the student should be prepared to choose his/her permanent advisor before the beginning of the second year. Selection of an advisor is a mutual decision, agreed upon by the student and faculty member who will serve as advisor. The advisor must be a member of the faculty of the Neuroscience Program. Ideally, the advisor will also be a member of the Graduate Faculty and have funding adequate to assure that the student will be able to complete the dissertation research in a timely manner. If the advisor is not a member of the Graduate Faculty, a co-advisor may be chosen to satisfy this requirement.

III. A. 3. Composition of the thesis committee
The thesis committee should be chosen by the student, with the advice of the permanent advisor, by the end of the second year. Students should carefully consider what strengths the members of the thesis committee will contribute to the student’s research and training experience. The thesis committee is made up of at least 4 but no more than 6 faculty members [including the advisor], of which 3 must be members of the Neuroscience Faculty. The members of the thesis committee must also be drawn from at least 3 different academic departments.

III. A. 4. Role of the advisor and thesis committee
The role of the advisor and thesis committee is to provide guidance and support to the student during the graduate career. The thesis committee is responsible for approving students' curriculum, evaluating student progress, administering and evaluating qualifying examinations, participating in dissertation proposal and defense meetings, and recommending a student for candidacy to the Ph.D. to the SSE Graduate Program office. In addition, the advisor is responsible for financially supporting the student’s research endeavors, and for providing or helping to obtain stipend support for the student when required.

III. A. 5. Meetings of the thesis committee
The thesis committee must meet at least twice each academic year to review student's progress. The advisor must provide a written report on the student's progress to the NPSC at the end of each semester. It is the responsibility of the student to call meetings of the thesis committee on a regular basis, so all the members are kept up to date on the student’s progress.

III. A. 6. Changes in the advisor or the thesis committee
These may be made by mutual agreement of the student and the concerned faculty member, and with the consent of the Steering Committee.

III. B. Research rotations

III. B. 1. Research rotations must be conducted in laboratories of members of the Neuroscience Faculty.

III. B. 2. Choice of laboratories in which to do research rotations
This decision should be based on research areas and should not be techniques driven. Techniques can always be learned during the dissertation research, including techniques that must be learned in laboratories other than that of the advisor. Students should meet with members of the Neuroscience Faculty to discuss their research areas and select laboratories in
which to rotate based on these discussions. Acceptance of students in faculty laboratories for research rotations is at the discretion of the faculty member.

III. B. 3. Time schedule
Research rotations should begin in the fall semester of the first year, but should be completed no later than the summer of the first year. Enough time should be spent in the laboratory to permit the student to complete the research objectives outlined by the faculty member at the beginning of the rotation; this is typically 6-8 weeks.

III. B. 4. Number of rotations
The completion of research rotations in three laboratories is required before the student selects a permanent advisor. Students wishing to choose an advisor before completing three rotations may petition the Program Director for an exception to this requirement. However, students are strongly urged to complete three rotations before making this decision.

III. B. 5. Credit for research rotations
3 credit hours may be earned for research rotation completed in the students first two semesters. Students should register for NSIP 7100, Research Rotations.

III. B. 6. Reporting requirements and grading of student performance
In order to obtain credit, the student is also required to submit a written report at the end of the rotation, detailing research objectives, techniques and accomplishments. This report is evaluated by the faculty member and a grade is submitted to the Program Director and the student, based on the report and the student’s performance in the laboratory.

III. C. Milestones of progress

III. C. 1. Coursework
Completion of 48 hours of coursework is expected to occur by the end of the fourth semester [spring semester, second year]. Tuition waivers are available only during the first two years of the program. Students are responsible for keeping abreast of the number of credit hours that they have accrued, and for ensuring that they have completed the required courses by the end of the second year.

III. C. 2. The Qualifying Exam
The Qualifying Exam or “general exam” is required of all students, by the SSE Graduate Program and the Neuroscience Program, and is an important milestone in the student’s progress toward the degree. The purpose of the exam is twofold: first, to examine the quality of the student's accumulated knowledge in neuroscience and second, to examine the student's ability to integrate that accumulated knowledge and apply it in the answering of a scientific question.

Time frame: The student is required to have taken the qualifying exam by the end of the first semester of the third year. Students who do not meet the time requirements for passing the Qualifying Examination will be subject to dismissal from the Program following review by the NPSC.

Format: the format of the qualifying exam is chosen by the student’s thesis committee, and must conform to one of the following formats:
A. **Standard exam.** Written questions will be submitted to the student by the Thesis Committee. The student will have a set amount of time to write answers (e.g. two hours per question, for a total of eight hours). Two weeks after this written exam, the student will be given an oral exam covering these same questions, as well as any other questions pertinent to neuroscience.

B. **Four-topic standard exam (Yale University Model).** The student, in consultation with the advisors, selects four topics (suggested two topics in developmental/cellular/molecular neuroscience and two topics in systems neuroscience). The exam committee is composed of faculty with expertise in these four topics. The student prepares a literature list (10-20 papers for each topic) and distributes this to the exam committee. The exam committee reads the literature and formulates a series of questions. The student chooses one question for each topic and writes an essay exam (four hours for each question, over two days). Two weeks later, the student is given an oral exam based primarily on the written exam.

C. **One-topic modified exam (Washington University Model).** A topic is chosen by the student from a limited list of topics formulated by the Thesis Committee (or an examination committee). The topic "should be sufficiently different from any thesis project which the student is then considering so the Committee is satisfied that the areas are distinct." The student will write a critical review of the literature, identifying what the student believes are the major research issues, and proposing "one of a few particularly promising avenues of research for the immediate future (the next five years)." Two weeks after submitting the written document (about 20 pages long, double-spaced), an oral exam will be given based primarily on the written exam.

D. **Grandiose grant proposal.** The student will develop a topic (which may be the same as that which the student intends to pursue for a dissertation). The student will develop a series of research strategies to address the topic. The strategies must include some approaches that are outside of the expertise of the student and the student's laboratory. That is, the proposal must be truly interdisciplinary and must challenge the student sufficiently. The student should write the proposal as if he or she is in command of an army of post-docs and an unlimited supply of money. Two weeks after submitting the written document to the committee, an oral exam will be given based primarily on the written exam.

E. **Competitive grant proposal.** A complete grant or fellowship application with budget and approval by requisite committees (animal and human use, safety, radiation, etc.). The grant should be of sufficient quality to be submitted to NIH or NSF and have a realistic chance of funding. Two weeks after submitting the written document to the committee, an oral exam will be given based primarily on the written exam.

F. **Literature review that is submitted for publication.** The student will select a topic which has not been reviewed for at least two years, and for which there are at least 50 references. The literature review must formulate the major questions in the field and propose general avenues to address these questions. The review cannot be used as the Introduction to the dissertation.

G. **As an optional component of the Qualifying Exam,** the Thesis Committee may add the following component to one of the above six formats, particularly if the student is interested in pursuing an academic career: Compose a class schedule that includes topics and synopses for each class session. Course may include lectures, laboratory exercises, and literature reviews in any combination, and may be taught by an instructor or a team. If literature review is included, describe how articles will be chosen (by faculty or
students, reviews vs. "classical" papers vs. current reports, etc.) and provide a sample list. Choose a textbook or a set of review articles if no text is available. Describe student written or oral assignments and how students will be evaluated. Give one lecture from the course, chosen by the examination committee from the class schedule.

Requirements for passing the exam: To pass the Qualifying Examination, the student must receive no more than one negative vote from his/her thesis committee. Should the student fail this examination, the thesis committee may require him/her to be reexamined on all or part of the fields covered, may require additional course work within or outside the Program, or may recommend his/her dismissal.

III. C. 3. The Prospectus
This represents another important milestone in the student’s progress toward the degree, as it is the final requirement for admission to candidacy for the Ph.D. within the SSE Graduate Program. The Prospectus, like the Qualifying Exam, is thus a requirement of the SSE Graduate Program as well as the Neuroscience Program. Until a student’s Prospectus has been approved by the thesis committee and the Dean of the SSE Graduate Program, the dissertation work has no official status.

The nature of the Prospectus: In essence, the Prospectus is an outline of the work that the student is proposing for his/her dissertation research, to which the thesis committee gives its approval. It provides a mutable framework for the student during the progress of the dissertation research: it is a map, not a contract. In consultation with the thesis committee, experiments can be added or deleted from those proposed in the prospectus, based on the success or failure of a particular avenue of research in real time. It is a starting point, not an end in itself.

The format of the Prospectus: The Prospectus must be prepared in two formats, one for submission to and approval by the Dean of the SSE Graduate Program, and one for submission to and approval by the thesis committee. The prospectus that is submitted to the Dean of the SSE Graduate Program should be approximately three double-spaced typewritten pages. The cover sheet should state the student’s name, department, the title of the proposed dissertation, and the names of the chair and the other members of the thesis committee. The introduction of the prospectus should contain a summary of earlier work on the problem. The body should include an orderly description of the plan for the investigation. The conclusion should clearly state the anticipated nature of the investigation results. Major sources of information should be indicated and a selective bibliography attached. The Prospectus that is submitted to the thesis committee should include a scholarly review of the relevant literature, which will serve as the foundation for the Introduction to the Dissertation. It should also include detailed descriptions of the proposed experiments, including hypotheses, rationales, techniques, methods of statistical analysis, and proper experimental and methodological controls.

Time frame: The Prospectus should be written and submitted to the thesis committee for review by the end of the third year of graduate school. The prospectus must be approved at least one year before the student plans to defend the dissertation.

Approval of the Prospectus: Two weeks after the student has submitted the Prospectus to the thesis committee, they shall meet for the purpose of approval of the Prospectus. The student should be prepared to present background material and the experimental design to the committee in a seminar format, which will be followed by a period of questions and
discussion on the proposed research. The student should be prepared to respond to questions on the relevant literature, research techniques, and the feasibility and significance of the proposed research. While the format may appear similar to that of an oral examination, its purpose is to agree on a creditable research project for the student to pursue in the dissertation research. For approval of the Prospectus, the student must receive no more than one negative vote from the thesis committee. If the thesis committee approves the student's Prospectus, it is implied that the student's dissertation project is approved. If the thesis committee does not approve the Prospectus, the committee will recommend to the student an appropriate course of action. Approval of the prospectus must be obtained at least one year in advance of the dissertation; if a shorted interval is required between approval of the prospectus and defense of the dissertation, the student must petition the NPSC for approval. Following approval of the Prospectus by the thesis committee, the Program Director submits a memo to the Dean of the SSE Graduate office recommending that the prospectus be approved by the SSE Graduate Program. The recommendation for approval of the Prospectus should include two copies of the Prospectus itself [short form; see above].

III. C. 4. Admission to candidacy for the PhD. Following the successful completion of 48 hrs of graduate coursework, the passing of the Qualifying Exam, and the preparation and approval of the Prospectus, the student is recommended to the Dean of the SSE Graduate Program for admission to candidacy for the Ph.D. The recommendation for admission to candidacy is made by the Program Director and must bear the signatures of both the chair of the student’s thesis committee and Program Director. The recommendation for admission to candidacy must be submitted to the SSE Graduate Program office no later than September 15 for those expecting to receive the degree in December, or December 15 for those expecting to receive the degree in May, or March 15 for those expecting to receive the degree at the end of the Summer Session.

III. C. 5. The Dissertation The written dissertation represents the culmination of the research efforts of the student during graduate training. A scholarly work of original research, it reflects the student’s ability to perform independent research and to prepare that work for presentation in a professional manner. "The dissertation is the necessary demonstration that the candidate is worthy of taking a place among research scholars in the discipline. It must demonstrate not only mastery of the literature of the subject, but also the ability to carry on independent research that results in a genuine contribution to knowledge or an original interpretation of existing knowledge, and it must do so in a literate and lucid fashion." [from SSE Graduate catalog]

Time frame: The time frame for completion of the dissertation research and the writing of the dissertation will vary somewhat from student to student, depending on the complexity of the project undertaken and the success of the experimental strategies used. The standard to which students should aspire is to complete the dissertation research and write the dissertation within four years of beginning the graduate program. While some students are able to achieve this standard, most students need five years to complete the program. The student should also note that approval of the prospectus and completion of the dissertation must be separated by at least a one year interval.

The written dissertation: The dissertation must be written in a form acceptable to the SSE Graduate office, which has detailed requirements for the format in which the document is prepared. The dissertation may be written as a free-standing document,
incorporating an introduction, statement of the problem, materials and methods, results, and discussion. However, if the student has submitted or is submitting the research for publication, the dissertation may consist of an introduction and review of the literature, followed by individual chapters containing the material submitted for publication, and a final summary of the overall findings. Because it is in the best interests of the student to publish data in the peer reviewed literature, the latter approach may be the most rewarding, as the data are written up for publication as well as for the dissertation. This approach also ensures that the data will be prepared for publication before the student leaves the program, which is in the best interests of both the student and the advisor.

The oral defense ["Final Examination"]: When the student has completed a satisfactory draft of the dissertation, in consultation with the advisor, the student may schedule the final oral defense of the dissertation. The student should provide copies of the dissertation to all members of the thesis committee and to the Neuroscience Program office at least two weeks before the date for which the defense is scheduled. Notice of the time and place of the defense must also be sent to all students and members of the faculty of the Neuroscience Program, who are invited to attend the defense. During the defense, the student will present a brief seminar, providing background for the problem and summarizing the major findings. This is followed by a period of questioning by the faculty, including both the thesis committee and other interested faculty. The student should demonstrate mastery of the subject during the period of questioning. At the end of the questioning period, the student will be excused and the thesis committee will vote on approval of the dissertation. To pass the examination, the student may receive no more than one negative vote.

Submission of the dissertation in final form: Following the oral defense, the thesis committee may make recommendations for revisions in the dissertation. Once these revisions have been made, the student prepares the dissertation in final form for submission to the SSE Graduate Program. A guide to the preparation of the dissertation may be obtained from the SSE Graduate Program office, and this should be consulted by the student and the advisor during the writing of the dissertation. If the dissertation does not conform to the requirements of the SSE Graduate Program, it will not be accepted and the student’s graduation may be delayed as a consequence. It is recommended that the student prepare a draft of the dissertation in final form for approval by the SSE Graduate Program, before printing the final copies for submission. The final copy of the dissertation must be accompanied by an abstract of the dissertation research [not more than 350 words in length], and both the dissertation and the abstract must be accompanied by appropriately formatted cover sheets, signed in black ink by the student and by the members of the thesis committee.

On or before the deadline date for dissertation submission [see the SSE Graduate Program’s academic calendar for exact dates], the student must hand into the SSE Graduate office the original copy of the dissertation (unbound), one abstract of the dissertation (not more than 350 words), application for degree, and Microfilming Agreement and Earned Doctorate forms (available in the SSE Graduate office). Each Ph.D. student will be required to have the dissertation microfilmed by University Microfilms in Ann Arbor, Michigan. Before typing the final draft of the dissertation, the
student should get a copy of the booklet Preparing Your Dissertation For Microfilming from the SSE Graduate Program office. The SSE Graduate Program office will forward the dissertation and microfilming form to University Microfilms. After it is microfilmed, University Microfilms will return the manuscript to the SSE Graduate office (about two months after it is submitted); the SSE Graduate Program will then send it to the Library for binding, cataloging, and shelving. Please visit the SSE Graduate office for related fees. University Microfilms publishes the abstract in its Dissertation Abstracts, and retains the master negative of the dissertation. Positive film copies of the dissertation may be secured from University Microfilms. One positive copy of the dissertation on film is deposited by University Microfilms in the Library of Congress, and the dissertation is listed in that library’s subject and author catalog. The student should keep a copy of the dissertation and submit another bound copy to the Neuroscience Program Office. A bound copy is typically presented to the advisor as well. [Adapted from the catalog of the SSE Graduate Program]

III. D. Evaluation of student progress

III. D. 1. Regular meetings of the thesis committee
Once the thesis committee has been chosen, the student should schedule meetings with the committee twice per year. During these meetings, the student’s academic progress and/or research progress should be reviewed by the committee. The committee may make suggestions for revisions of the research plan when necessary. It is in the student’s best interest to meet with the thesis committee on a regular basis, both to receive advice on ongoing research and to be certain that the thesis committee members are up to date on the student’s research progress. As the student continues to progress, the thesis committee and the student should also agree on when the student has completed a satisfactory amount of experimental work and should thus begin writing the dissertation. This is most easily achieved if the thesis committee has received regular updates on the student’s progress during the semiannual meetings.

III. D. 2. Semiannual review by the Steering Committee
Twice a year, advisors are requested to prepare a summary of student progress for review by the Steering Committee.

III. D. 3. Inadequate progress and remedies for inadequate progress
Timely attainment of milestones such as passing of the Qualifying Exam and the approval of the Prospectus is expected. Failure to achieve these milestones will be addressed by the Steering Committee in consultation with the advisor, and appropriate remedies will be sought. Students who fail to meet milestones within the required period of time must also petition the Steering Committee for an extension of the time allowed for completion.

III. D. 4. Dismissal from the program
It is the goal and desire of the Steering Committee that all students should complete the graduate program and earn the Ph.D. However, if a student consistently fails to meet required performance standards, either of the SSE Graduate Program or of the Neuroscience Program, the student may be considered for dismissal from the program.
III. E. Career development

III. E. 1. Attendance at seminars and journal club
To function effectively, scientists must keep abreast of current developments in the field. Regular attendance at seminars and journal club [“Trends”] helps to train the student in attentive listening and critical thinking skills that are required for evaluation of current research in neuroscience. This course also provides training in how to present material to a class.

III. E. 2. Presentation of seminars
Whatever career path a student may plan to pursue – in academia or in industry – the ability to clearly present one’s work in an oral format will be required. To learn and perfect this necessary skill, the student should be prepared to present seminars during the course of his/her progress toward the Ph.D. Confident public speaking ability is attained through repetition and practice, and is easiest to achieve before a friendly audience, such as the faculty and students of the Neuroscience Program. It is recommended that the student present at least two seminars during the course of the program: one seminar early in the research period, presenting a review of the literature, an outline of proposed work, and preliminary data that has been obtained; and a second seminar, close to the end of the student’s research, summarizing the work and the major findings. This second seminar provides excellent preparation for the senior student who is about to embark on a round of “get-a-job” seminars as the student moves on to the next career level.

III. E. 3. Presentation of research at local and national meetings
Regular presentation of one’s research at local and national meetings is an essential part of career development, both for students and for mature scientists. For students especially, it provides a forum in which the student may make contacts that may be important in finding a job or post-doctoral fellowship after graduation. For all, it is an important way of establishing a professional identity among one’s colleagues. Both poster presentations and platform presentations have merit, and certain kinds of data lend themselves better to one or the other type of presentation. The important thing is to get out there and present the data. While travel can be expensive, the Graduate School has a certain amount of money available to support student travel to meetings, and the Neuroscience Program may be able to help as well. Also, some societies provide student travel awards. And don’t overlook the opportunity to present at local meetings – including the Society for Neuroscience, which meets in New Orleans every three years.

III. E. 4. Publication of research
Even more important than presenting data at scientific meetings is the necessity for publishing the data in the peer-reviewed scientific literature. Students should try to prepare their results for publication as they obtain them, rather than waiting until the end and being faced with writing the dissertation and the publications with a time deadline looming. What may happen under these circumstances is that the dissertation gets written but the manuscripts do not. It is thus to the student’s advantage to submit research for publication in a timely manner, and as the first author when this is merited.

III. E. 5. Research ethics
The ethical conduct of scientific research is essential for students as well as mature scientists. Students are expected to participate in the Responsible Conduct of Research sequence, a series
of seminars and workshops that is offered in alternate years. One hour of graduate credit may be obtained for attendance. Students should also familiarize themselves, when appropriate, with ethical procedures for the care and use of animals in research, or the use of human subjects. Students should also be aware of what constitutes research misconduct that may subject the student to dismissal from the program as well as sanctions by funding agencies. A recent draft prepared by the White House Office of Science and Technology Policy, provides the following guidelines:

- "Research misconduct is defined as fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results.
- Fabrication is making up results and recording or reporting them.
- Falsification is manipulating research materials, equipment or processes, or changing or omitting data or results such that the research is not accurately represented in the research record.
- Plagiarism is the appropriation of another person's ideas, processes, results, or words without giving appropriate credit, including those obtained through confidential review of other's research proposals and manuscripts.
- Research misconduct does not include honest error or honest differences of opinion."