2013-2014

Student Guide

Graduate Training in Neuroscience

Emory University

Key Contacts

Gary Longstreet
Program Coordinator
gary.longstreet@emory.edu
1462 Clifton Rd, Suite 314
tel# 7-3707

Dr. Shawn Hochman
Program Director
shawn.hochman@emory.edu
644 Whitehead

Dr. Victor Faundez
DGS #1 (for students in yrs. 1-2)
vfaundez@emory.edu
446 Whitehead

Dr. Malu Tansey
DGS #2 (for students in yrs. 3+)
malu.tansey@emory.edu
605L Whitehead

TABLE OF CONTENTS

1. Contents

2. Overview of Program Administration

Leadership Contacts and Roles	
Program Coordinator Gary Longstreet gary.longstreet@emory.edu 1462 Clifton Rd, Suite 314 tel# 7-3707	**Responsible for overall coordination of the neuroscience program including:** - First point of contact for student inquiries. - Most knowledgeable on overall student requirements responsibilities and program organization.
DGS #1 Dr. Victor Faundez vfaundez@emory.edu 446 Whitehead	**Oversees student academics in years 1 & 2 including:** - Academic and program-related personal issues. - Approval of student rotation proposals and reports. - Construction of written qualifying exam.
DGS #2 Dr. Malu Tansey malu.tansey@emory.edu 605L Whitehead	**Oversees student academics in years 3 & above including:** - Academic and program-related personal issues. - Organizes/administers oral qualifying exam. - Monitors and ensures adequate student progress. - Attends final dissertation committee meeting. - Chairs thesis defense.
Program Director Dr. Shawn Hochman shawn.hochman@emory.edu 644 Whitehead	**Oversees overall program operations including program development, curriculum, recruitment** - Chairs Executive committee - Program representative at GDBBS and Laney Graduate - School Program Director meetings. - Manages students affairs with DGS #1 and DGS #2

3. Purpose and Goals of the Graduate Program in Neuroscience

The study of the mechanisms by which the brain controls and integrates organismal function is one of the most exciting and rapidly advancing areas of modern science. The general field of neuroscience involves the study of the nervous system at all levels of organization, from single molecules transporting specific ions across biological membranes, to large interconnected networks of neurons controlling complex motivated behaviors. Scientists in this challenging area must consequently cross the normal boundary lines dividing traditional disciplines and employ complex multidisciplinary approaches to begin to understand brain function. Neuroscience draws upon knowledge developed in all of the traditional disciplines, including anatomy, biology, biochemistry, microbiology, physiology, pharmacology, and psychology. The

task of the neuroscientist is to choose the most appropriate tools and approaches from each of these disciplines that will assist him or her in unraveling the mechanisms by which neurons and glia perform their integrative functions.

The graduate program in Neuroscience provides the multidisciplinary training required for a successful research and teaching career in neuroscience. The program allows the student to learn currently accepted scientific facts and theories; learn to plan, conduct and critically evaluate experiments; make an original contribution to scientific knowledge; become skilled in oral and written communication; and become self-sufficient in continuing education beyond graduate school. The program also prepares the student to teach neuroscience and related disciplines in professional and graduate schools. Because of the diversity of program goals and the variety of approaches used in neuroscience, the program is broadly based with Program members drawn from across 24 Departments and Centers, such as - Anesthesiology, Anthropology, Biochemistry, Biology, Biomedical Engineering, Biostatistics (SPH), Cell Biology, Digestive Diseases, Economics, Emergency Medicine, Environmental and Occupational Health (SPH), Epidemiology (SPH), Human Genetics, Neurology, Neurosurgery, Ophthalmology, Otolaryngology, Pathology, Pharmacology, Physiology, Psychiatry, Psychology, Radiology, Rehabilitative Medicine, and the Yerkes National Primate Research Center.

4. Philosophy of Graduate Training

Graduate training in the Neuroscience Program is research-focused and differs considerably from undergraduate or professional school. The formal course work is intended to provide basic knowledge as well as guidance for self-education by the student scholar. Such self-education is a full-time job and must be an active, rather than passive, process. Much of graduate teaching consists of individualized instruction between students and their advisors, in an atmosphere of cooperative research and discovery.

Students should consider the graduate training program as the beginning of their professional careers, rather than as an extension of schooling as they have known it. The graduate student does many of the same things that occupy professional scientists: reading scientific literature; planning, conducting, and analyzing experiments; and publishing papers. The earlier the student becomes proficient at these endeavors, the sooner and further his or her career will progress. Scientific research can be discouraging at times and a great deal of inertia sometimes must be overcome to bring a project to conclusion. However, the rewards to the dedicated student include a sense of accomplishment, independence, and discovery; as well as entry into a challenging profession.

5. Newly Arriving Students

Incoming students will be sent information several weeks prior to registration. The Graduates in Neuroscience (GIN) Student Activity Group will assign a current graduate student as “Neuro-buddy” to each incoming student. These Neuro-buddies will contact the incoming student and

work with him/her to help make the transition to graduate school. The Program Coordinator will also be in contact with the incoming student regarding the scheduling of courses and orientation. At the beginning of the term, there will be an orientation session that will cover various aspects of the Program. This will be followed by a reception for the new students to meet other student leaders and members of the Executive Committee.

A. International Students and Language Requirements.

The policy of the Graduate School of Arts and Sciences is that all new international students must participate in English language assessments prior to registration and enrollment. Evaluations may occur over the telephone or by direct assessment by a team of linguistics experts. If deemed necessary, students must complete the English as a Second Language Program that includes three required courses. Direct questions about evaluation and the program itself should be referred to Ms. Grace Canseco, ESL Director, Graduate School of Arts and Sciences, 727-2183.

6. Program Administration

A member of the Program faculty who serves as Program Director coordinates the graduate program. The Program Director works in conjunction with the two Directors of Graduate Studies, the Program Executive Committee and the Program Coordinator. The Director is responsible for coordinating the Directors of Graduate Studies in monitoring the performance of students, scheduling, organizing the qualifying examination, overseeing selection of research advisors and dissertation committees. In addition, the Program Director is the representative of the Neuroscience Program to the Graduate Division of Biological and Biomedical Sciences and the Laney Graduate School Executive Committees, which oversee policy and curricular matters. The Admissions Committee, which is comprised of Neuroscience Program faculty, is chaired by a member of the Executive Committee who is responsible for providing information on the graduate program to prospective applicants and overseeing admissions. The two Directors of Graduate Studies (DGS) work with each student to develop an appropriate program of study in the early stages of training before the selection of a research advisor, and they monitor student progress until graduation.

The Director serves a three-year term with the possibility of renewal for additional three-year terms, beginning on May 1 and ending April 30. A Nomination Committee comprised and chaired by faculty members, including some who are not members of the Executive Committee, solicits nominations for the position of Director, from faculty in the program. This committee presents a recommended list to the Executive Committee with alternates and the Executive Committee makes final selection. The Executive Committee terms are three-year terms beginning on May 1 and ending on April 30. Executive Committee members do not normally serve more than 3 consecutive terms. New members will be elected regularly. No more than five members of the Executive Committee can be from any one department.

7. Advising

Upon entering the Neuroscience Program, the DGS #1 will serve as a temporary advisor until each student has chosen a thesis advisor in the Fall of the second year. A thesis advisor must be requested and approved by the DGS in writing. In cases where the DGS sees potential problems, the request may be brought before the Executive Committee for approval.

8. The Importance of Discipline and Setting Deadlines

A major challenge for students undertaking doctoral study in their early years is that the deadline for completion of their thesis is far away. Consequently, students are easily sidetracked and often overcommit in other areas with more immediate deadlines that end up taking much more time than anticipated (e.g. teaching). The net result is that their senior years are exceptionally stressful. **IT ALWAYS TAKES MANY MORE HOURS THAN ANTICIPATED TO COMPLETE PROPOSED STUDIES**. Moreover, science is unpredictable so failures in various experimental approaches are inevitable and add to the stress burden in your senior years.

Discipline is not a hallmark of human behavior. However, accomplishing tasks by specific deadlines is one skill we learned very well throughout our education. Therefore it is very important to set specific short-term and intermediate-term deadlines as a roadmap for completion of your doctoral work within a reasonable time. ***Appendix 4*** provides some survival guide checklists to help you get started - including on time management and productivity. It is strongly recommended you plan specific steps/corresponding deadlines for completion of your thesis with your advisor as soon as your project becomes clearly defined. You will find that many re-calibrations will be required. Many seemingly reasonable deadlines in terms of thoughts end up being unrealistic in terms of actions. Thus deadlines need to be set, reset and readjusted but they nevertheless give you a good measure of the level of effort required to keep you on track for completion within a reasonable period of time.

9. Laboratory Research Rotations

During the first year in the program, each student will have the opportunity to do experimental work in faculty laboratories. These laboratory "rotations" provide students with an early opportunity for research experience. The rotations are designed to expose the student to different research approaches. These laboratory experiences will help familiarize the student with some of the many techniques used to examine research problems in neuroscience. As such, the rotations can help define each student's own research interests. This experience is an important antecedent to determining an area for a thesis project and the selection of a research advisor, although the choice of advisor is certainly not limited only to those faculties with whom the student has rotated. The laboratory research rotations also provide faculty with an opportunity to observe and evaluate the performance of beginning students in a research setting.

First year Students are required to complete a total of three laboratory rotations. During the semester in which the students satisfy a rotation requirement they should register for NS 597R (Laboratory Rotations) for an S/U grade. It is recommended that students begin their first rotation in the Fall semester, and complete their third rotation by the end of the summer between years 1 and 2. Rotations do not necessarily need to coincide with the semester schedule, but should be a minimum of 8 weeks during the Fall and Spring semesters. Students may, with prior permission, perform two 6-7 week rotations during the summer after their first year. Students entering the program in Advanced Standing may request fewer rotations at the discretion of the Director of Graduate Studies. Also, in consultation with the DGS, and agreement by their lab mentor, students may perform their first rotation, for a minimum of 6 full-time (minimum 40 hours/week) weeks, the summer prior to their first semester of classes. Students who wish to perform a rotation in the summer prior to the beginning of their first year, must find a mentor who will be willing to cover their stipend during that summer rotation period. The registration deadline for these rotations is May 1. The typical starting date for these rotations is June 1 or July 1.

At the beginning of the Fall semester, the Program Coordinator will arrange a series of faculty orientation sessions. Faculty who are interested in acquiring new students will present a brief, 10-minute orientation session of their lab research. Students will be provided with a lab profile form from each lab, which will help the students in choosing their rotations. The student in consultation with the Director of Graduate Studies will arrange the schedule of rotations for each student. In arranging these rotations, every attempt will be made to accommodate the wishes of students who are already interested in the research programs of particular faculty members. Information is available on the program website (www.emory.edu/NEUROSCIENCE) to students entering the program prior to their arrival at Emory that gives a brief description of the research interests of program faculty. Students should choose three or four faculty members from these descriptions, contact these faculty members, and meet with them early in the Fall semester. Based on these meetings, each student can make an informed decision as to the most appropriate lab for the first rotation. Students can contact the Director of Graduate Studies for assistance in scheduling these interviews.

A. How to select laboratory rotations

"An ounce of prevention is worth a pound of cure". It is better to try to keep a bad experience from happening than it is to fix one. It is strongly advised that students use a checklist to remember to ask all the questions of significance to them prior to selecting a lab. Rotation Lb choice is usually based on consideration for subsequent doctoral studies. It is therefore extremely important to make sure you ask all the key questions prior to making a commitment. It is strongly recommended that you bring the checklist below to ensure you do not forget to ask essential questions prior to committing.

ROTATION MENTOR QUESTION CHECKLIST
☐ **Are you currently taking students/ would you have funding to support me should I choose your lab for a dissertation?**
☐ **Approximately how many graduate students have you trained, how long do they typically take to graduate, and what are they doing now?**
☐ **What projects are you currently working on? How much freedom do I have to customize my research interests?**
☐ **Who would be training me? How much contact time do you normally have with students?**
☐ **What are your expectations of me during my lab rotation in terms of goals of the rotation and the number of lab hours/week necessary to achieve these goals?**
☐ **What would your expectations of me be as a doctoral student?**
☐ **How do you help students develop their research skills and hone independence in the lab? What are your views on professional career development outside the lab?**
☐ **How would you describe the environment of your research group inside and outside the lab?**
☐ **What are the rules for student attendance and presentation at scientific meetings?**

B. Rotation Proposals

After selecting a rotation advisor, each student must send a Rotation Proposal Form (***Appendix 5***) to the Director of Graduate Studies stating the name of the faculty member with whom the rotation will be completed and a brief summary of the research proposal the student will be involved with.

This form must be signed by both the student and the rotation advisor and must be submitted two weeks prior to beginning the rotation.

The duration for the lab rotation during the Fall and Spring Semesters may vary from a minimum of 8 weeks to a maximum of 15 weeks. It is very important for the student and Faculty mentor to agree on the duration of the rotation before a rotation proposal is submitted to the DGS.

Students who wish to do a rotation in a laboratory of someone who is a member of the Graduate Division (GDBBS) but not a member of the Neuroscience Program must receive prior approval from the DGS #1 (Victor Faundez).

C. Rotation Reports

At the end of each rotation, students are required to submit a rotation report that summarizes their work to the DGS #1 (Victor Faundez). This report must be signed by both the student and the advisor and must be submitted to the DGS. **Guidelines for preparing the Rotation Report are provided as a linked document in the Appendix.** Students working in labs for the entire

summer must submit reports by the last week of August prior to the beginning of Fall Semester classes.

This form must be submitted no later than two weeks after the completion of each rotation.

Students who have not submitted a rotation report by the due date will receive an incomplete for the rotation. If the rotation report is not received within 2 weeks after the end of the semester, the incomplete will be changed to an Unsatisfactory. According to Graduate School guidelines, any student who receives an incomplete for two or more courses will be automatically terminated from the graduate program.

D. Rotation Evaluation

At the end of each rotation, advisors are required to submit a Rotation Evaluation Form (***Appendix 6***) signed by both the student and the rotation advisor, of completion of the rotation with S/U grade and should be submitted to the DGS (Victor Faundez). The advisor must discuss the content of this evaluation with the student before sending it to the DGS. The rotation grade must be provided prior to final exam week of ongoing semester so that the grade may be submitted. For students working in a lab for the entire summer, the rotation evaluations are due the last week of August prior to the beginning of Fall classes.

The purpose of the rotation is not to complete a research project and no student is obliged to continue a rotation beyond the agreed upon period. The S/U grade on the rotation is to be assigned by the advisor based on the work effort of the student during the defined term of the rotation. To avoid confusion and make sure advisors and students agree regarding the goals of the rotation and the number of lab hours/week necessary to achieve these goals, it is highly recommended that they discuss this prior to the beginning of the rotation.

MD/PhD students normally complete one or two rotations during the summer between their first and second years of basic health science classes in the Medical School. Another rotation is completed during the Spring semester of their second year of Medical School. Some students also complete a rotation during the summer prior to the beginning of their first year of basic health science classes in the Medical School.

10. Grades

The scale of grades in the Graduate School ranges from **A** (4.0) to **C** (2.0) and **F** (0); there is no D grade. Some courses, including the required sequence of neuroscience seminars and the lab rotations, are taken on a Satisfactory/Unsatisfactory (S/U) basis.

Students in the graduate program are expected to maintain an overall average of B (3.0) or better.

All students must maintain a minimum GPA of 3.0 in each semester of graduate work. If a student's GPA is below 3.0 in any semester, that student will be placed on academic probation with the expectation that he/she will maintain a semester GPA of 3.0 in all subsequent

semesters he/she enrolls in a letter grade course and/or research dissertation. If a student's semester GPA is below 3.0 in any two semesters (contiguous or not), or if he/she receives one F or U grade in any course, that student will be asked to withdraw from the Program and the Division. If a student who is asked to withdraw believes that there were extenuating circumstances that adversely affected his/her performance, he/she may submit to the DGS and the Executive Committee and the Division Director a written appeal for consideration of reinstatement. The appeal should clearly outline the extenuating circumstances and must be submitted within one month of grades being recorded by the Office of the Registrar. The Neuroscience Program Executive Committee and the GDBBS Executive Committee will review all appeals. If both the Neuroscience Program and GDBBS Executive Committees approve reinstatement, the student will be expected to maintain a GPA of 3.0 in every subsequent semester.

If a student receives a grade of C or F in any one of the four required Neuroscience courses (IBS 526: Neuroanatomy & Systems Neuroscience, IBS 514: Cellular, Molecular, Developmental and Translational Neuroscience, IBS 522: Grant Writing, or IBS 538: **Design & Analysis of Experiments)** that course must be repeated and a minimum grade of "B" (3.0 or higher) must be obtained. At the discretion of the Program, a failing grade in other required courses may also necessitate repeating the course.

To advance to candidacy, the student must have completed a minimum of 48 credit hours (24 of which are in coursework) and have a cumulative GPA of at least 3.0.

A minimum of 16 credit hours of coursework must be taken in year 2 (or beyond) of study.

11. Courses

A. Required Courses

The overall course requirements to obtain a Ph.D. are published in the Laney Graduate Handbook. The following courses are usually required for all Neuroscience students. A typical schedule is shown in Appendix 1.

(I) PHD STUDENTS

Note: According to newly implemented changes in the Laney Graduate School, each student need only register for at least 9 rather than the previous 12 credit hours per semester to maintain status as a full-time student. ***The Neuroscience Program still requires students to take a minimum of 12 credit hours.***

Course Number	Course Title	Credits
Semester 1 (Fall)		
IBS 526	Neuroanatomy and Systems Neuroscience	7 Credits
NS 551	Techniques in Neuroscience (S/U)	1 Credit
NS 570R	Professional Development, Communication & Ethics (S/U)	2 Credits
IBS 530R	Frontiers Seminar (S/U)	1 Credit
NS 597R	Laboratory Rotation (S/U)	1 Credit
PSI 600	Program for Scholarly Integrity (pre-semester)	0 Credits
Semester 2 (Spring)		
IBS 514	Cellular, Dev. Molecular and Translational Neuroscience	7 Credits
NS 570R	Neuroscience, Communication and Ethics (S/U)	2 Credits
IBS 530R	Frontiers Seminar (S/U)	1 Credit
NS 597R	Laboratory Rotation (S/U)	2 Credits
Summer (between years 1 & 2)		
RES 999GSAS	Graduate Residence	9 Credits
During the summer term, students should register for RES 999GSAS (Graduate residence).		
Semester 3 (Fall)		
IBS 699R	Advanced Graduate Research	5-9 Credits*
NS 790R	Advanced Graduate Seminar	2 Credits
TATT 600	Teaching Assistant Training & Teaching (non-credit mini –course)	N/A
IBS 530R	Frontiers Seminar (S/U)	1 Credit
XXXXX	Elective course(s)	4 Credits#
If still needing to rotate during this semester, this course must be replaced by NS 597R-Laboratory rotations		
#Note that students must have completed a minimum of 4 credits of elective courses to advance to candidacy. These four credits can be granted through a single course or more#.		
Semester 4 (Spring)		
IBS 699R	Advanced Graduate Research*	2-6 Credits*
IBS 538	Design & Analysis of Experiments**	4 Credits**
IBS 522R	Grant Writing	4 Credits
IBS 530R	Frontiers Seminar (S/U)	1 Credit
IBS 606	Values in Science (pre-semester)	1 Credit
XXXX	Elective***	4 Credit Course***

the number of credits that should be chosen for IBS 699R is adjusted to make it up to a total of 9 credit hours for the semester depending on other courses the student must register for

or other graduate Stats course after consultation with the DGS

if not yet completed. Each student must have registered for a total of 4 credit hours towards elective courses during their first two years of study to advance to candidacy

(II) MD/PHD STUDENTS

MD/PhD Coursework

Course Number	Course Title	Credits
Med yr 1 (Fall)		
IBS 530R	Frontiers Seminar (S/U)*	1 Credit*
NS 570R	Professional Development, Communication and Ethics (S/U)	2 Credits
Med yr 1 (Spring)		
IBS 530R	Frontiers Seminar (S/U)*	1 Credit*
IBS 530R - M1 students may miss no more than four seminars per semester		
Med yr 2 (Fall)		
IBS 530R	Frontiers Seminar (no enrollment, but strongly encouraged to attend)	
Med yr 2 (Spring)		
IBS 530R	Frontiers Seminar (no enrollment, but strongly encouraged to attend)	
NS 570R	Professional Development, Communication and Ethics (S/U)	2 Credits
Grad yr 1 (Fall)		
IBS 699R	Advanced Graduate Research	5-9 Credits
NS 790R	Advanced Graduate Seminar	2 Credits
IBS 530R	Frontiers Seminar (S/U)*	1 Credit*
TATT 600	Teaching Assistant Training & Teaching	non-credit mini-course
XXXX	Electives**	4 Credits Course**
Grad yr 1 (Spring)		
IBS 699R	Advanced Graduate Research	5-9 Credits
IBS 522R	Grant Writing	4 Credits
IBS 530R	Frontiers Seminar (S/U)*	1 Credit*
IBS 538	Design & Analysis of Experiments (or another graduate stats course)	4 Credits
XXXX	Electives **	4 Credits Course**
IBS 530R - G1 students are allowed no more than two absences per semester		

Electives- G1 must register for total of 4 credit hours of elective courses before their oral qualifying examination (Fall of G2). These four credits can be gained through a single 4 credits course or two elective courses of lower credit hours

In addition to these course requirements, the MD/PhD students' curriculum can be adjusted based upon the student's background, performance and interests, in consultation with the DGS of the Neuroscience Program. Although MD/PhD students do not have to register and pass exams of IBS 526 (Neuroanatomy and Systems Neuroscience) and IBS 514 (Cellular, Molecular, Developmental and Translational Neurosciences), they are strongly encouraged to audit these two courses (or part of it) before they take their written qualifying examination.

B. Course Exemptions

Students may be exempted from taking one or more of the required courses under appropriate circumstances. Such circumstances usually consist of having taken a prior graduate course with similar content and received a grade of "B" or better, or demonstration of competence in a particular area (usually by special examination). These exemptions require consultation with and approval by the Director of Graduate Studies, and previous coursework syllabi should be provided.

C. Elective Courses

All neuroscience students must meet the minimum course credit requirements of the Graduate School by taking a personalized selection of elective seminar and research courses. Only one elective course (at least 4 credit hours) is required by the program, but students are encouraged to pursue all those electives directly relevant to their development as a neuroscientist. Elective courses must add up to at least 4 credit hours or more, and must be taken during the first two years of study (for PhD students or during G1 for MD/PhD), in order to provide students with enough course credits to advance to candidacy after having passed their oral qualifying examination in Fall of Year 3. A Neuroscience Elective list is provided in Appendix 2. Although students are encouraged to select their required elective(s) from this list, any other science courses that are considered important for the student's formation in Neuroscience research can be credited as an elective after approval by the DGS of the Neuroscience Program. As new courses by the Neuroscience faculty are added, this list will be updated. Note that some of these courses are not offered every year. It is recommended that students contact the Director of Graduate Studies or the Program Coordinator to get an updated list of electives when comes the time to enroll.

D. Rotation and Research Credits.

During any given semester, each student must register for at least 9 credit hours to maintain status as a full-time student; registering for a combination of formal courses and research credits usually accomplish this requirement for time that will be spent in the laboratory. During the Fall or Spring semesters in which the student is taking a laboratory rotation, they should register for NS 597R (Laboratory Rotations) for either 2 or 3 credit hours. For the summer rotation, the division office will register students for RES 999GSAS (Graduate residence) for 9 credit hours. After completion of the required laboratory rotations and selection of a permanent research advisor, the student should register for IBS 699R, Advanced Graduate Research. This "course" is for variable credit and the number of credit hours registered for should be the number needed to bring the total (with formal courses) to total 9 credit hours. After the student has successfully passed the oral qualifying examination (Fall of Year 3) and has accumulated the required course credits to advance to candidacy, they should register for NS 799R, Dissertation Research.

12. Course Descriptions

A. Frontiers in Neuroscience (IBS 530)

This is a weekly seminar series in which various topics in modern neuroscience are discussed. Seminars are often presented by program faculty or visiting outside neuroscientists. Rather than presenting a typical research seminar, speakers are asked to present material with sufficient background material to be readily understood by students as well as faculty outside the speaker's specific field of research. It is intended that the seminar should provide a more didactic and interactive meeting than usually occurs in a more traditional research seminar. All students in the Neuroscience Program are strongly encouraged to attend the Frontiers in Neuroscience seminar series. Attendance is required for all PhD students in their first two years of study, and only two absences per semester are permitted without DGS approval.

Students in their first two years are assigned one credit for attendance and given an S/U grade each semester. Students who miss more than two seminars without prior DGS approval will receive an unsatisfactory grade for the course, and will have to retake the course the following semester.

Due to the MD/PhD program schedule, M1 students may miss no more than four seminars per semester, but G1 students are only allowed two absences.

B. Advanced Graduate Seminar (NS 790R)

This course is divided into two parts: During the first half of the course, second year students will read, research, present, and critically evaluate a research article. Specific instructions as to what is expected in the written critique will be issued to the students at the beginning of the course. The Journal of Neuroscience "Journal Club" articles is the format of critiques used in this course (see link http://www.jneurosci.org.proxy.library.emory.edu/site/misc/ifa_features.xhtml for more information). The students may spend only 8 hours, reading, researching, and writing material related to this paper. The University Honor Code will be observed throughout. The critiques of research articles will be evaluated by 2 faculty with expertise in the area and assigned a grade S/U. If a student does not achieve a satisfactory grade in their attempt, he/she will have to write a second critique until a satisfactory grade is achieved. An unsatisfactory grade in the second attempt will be grounds for dismissal from the program. During the second half of this course, second year students will give a 20 minute oral presentation of their thesis proposal and preliminary results, and receive feedback on the research plan and its presentation. The aim of the course is to practice critical evaluation of scientific publications, to refine presentation skills and start developing specific aims for their research projects. The third year students are required to attend this part of the course to serve as mentors for the second year students.

C. Grant Writing (IBS 522R)

During this course, each student will be paired with at least 2 faculty mentors and one student mentor from the NS program who has already taken the course. In this way, the students' progress in the preparation of their grant proposal can be followed from beginning to the end. Students are required to meet with their mentors 4 times during the semester to receive feedback on each section of the grant proposal. These are mandatory meetings to be arranged by the student. Faculty and student mentors will provide the course director with an evaluation of the student's responsiveness and progress during the semester, which will serve as a third of the students' final grade. Another third of the final grade will be allocated to the averaged scores given to the proposal during the students and faculty study sections. Finally, one third of the grade will be devoted to meeting class deadlines.

Third year students must take advanced seminars during the Spring semester only. In the Fall they will have their oral examination (see below). The role of third year students in the Spring semester will be to help second year students in the preparation of their research proposal through critical discussion of their oral presentations. Both Introductory and Advanced Seminar courses are strictly S/U. Fourth year students and beyond are not required to take Advanced seminars.

13. Related Program Requirements

A. Events Sponsored by Atlanta Chapter of the Society for Neuroscience.

In addition to the regular course and research requirements, students in the Neuroscience program are expected to participate in several events sponsored by The Atlanta Chapter of the Society for Neuroscience. This organization is comprised of Neuroscientists from Emory as well as several other Universities in the Atlanta area, such as Georgia State University and Georgia Institute of Technology. Events sponsored by the Local Chapter of the Society for Neuroscience include:

(i) Neuroscience Poster Preview.

One of the most important national scientific meetings for neuroscientists is the Annual meeting of the Society for Neuroscience. It is anticipated that most students in the Neuroscience Program will present their research at the Society for Neuroscience meeting during their tenure at Emory. These presentations can be given as oral communications, but more commonly in a poster format. The Neuroscience Poster Preview is an annual event that occurs 3 - 4 days prior to the national Neuroscience meeting which provides an opportunity for those who will be presenting at the meeting to share the content of their poster with the local neuroscience community. This preview provides an excellent opportunity for Neuroscience students to practice their presentation before going to the national meeting, to make other members of the Atlanta neuroscience community aware of their research, and to learn of the research being conducted by other neuroscientists in the Atlanta area. All students in the Neuroscience program are expected to attend the Poster Preview. Students who are scheduled to present a poster at the national Neuroscience meeting are strongly encouraged to present their poster at the Poster Preview. This poster preview also represents a unique opportunity for first year students to know more about some of the work going on in many laboratories of Neuroscience program faculty and use this information to plan their laboratory rotations. The SFN Committee will present a travel award for the best NS student poster at the poster preview. Rather than prepare a polished poster, students who plan to give a slide presentation can simply post hard copies of their PowerPoint presentations without detailed legends and orally communicate the material to interested attendees. Students who will not attend the national Neuroscience meeting but who have prepared a poster for another meeting are also encouraged to present their poster.

(ii) Brain Awareness Month.

Typically held each Spring semester. NS students are asked to participate in presentations of various aspects of NS research to High School students in the Atlanta area. In general, the student representatives of the Atlanta Chapter of SFN organize this event and contact the NS Graduate students to participate.

B. Special Lectureships

In addition to the regularly scheduled events mentioned above, the local Neuroscience Society chapter and the Neuroscience Program often invite internationally recognized neurobiologists to come to Emory to present a seminar and meet with the Neuroscience students. The Graduates in Neuroscience chartered graduate student group and the Women in Neuroscience also sponsor an invited annual Spring speaker. As with the Neuroscience Symposium, such seminars provide an excellent opportunity for students to gain up-to-date information about

various aspects of neurobiology and meet with scientists from other institutions. All Neuroscience Program students are expected to attend seminars sponsored by the program or the local Neuroscience Society chapter.

C. Journal Clubs and Common Interest Groups.

One of the most effective ways to learn methods and approaches to scientific inquiry is to read and critique the experimental work published by other investigators. In addition, specific journal clubs or common interest groups distributed across departments and centers throughout the university often represent areas of special strength in the Program. Students are strongly urged to make themselves aware of these opportunities and to participate in these groups since they provide a mechanism for interacting with faculty and developing the student's scientific skills.

14. Selection of Research Advisor

Students are expected to select a research advisor from among the Faculty of the Division of Biological and Biomedical Sciences by the beginning of the **Fall semester** of the second year. **Under extenuating circumstances, a research advisor can be selected after a Fall semester rotation but no later than Spring semester of the second year. Failure to meet this deadline will require the student to petition the director of GDBBS for continuation of stipend support. Once a student has identified an advisor, they should have him/her complete the GDBBS_Mentor_Agreement _Form (see Appendix 1) and submit this to DGS #1 for approval.** All choices of dissertation research advisors are subject to final approval by the DGS #1 acting on behalf of or in concert with the Executive Committee. Although every effort is made to accommodate the student's indicated preferences, in rare instances it may not be possible to assign a student to his or her first choice. A faculty member who already is serving as research advisor to more than one student may not be able to take on another due to lack of physical resources. It is also possible that a faculty member may not have adequate financial resources to support the research of a new student entering the laboratory. Should a student wish to have a research advisor that is not a member of the Neuroscience Program, or to have co-advisors it must be explicitly approved by the DGS acting on behalf of or in concert with the Executive Committee.

Students entering in Advanced Standing, for example, those with a Master's degree may choose their advisors immediately, or after optional rotations as discussed above.

The matching of a student with a research advisor is not irrevocable. On rare occasions it may be in everyone's best interest to reassign the student to a different advisor. For example, research interests might change over time so that those of the student are no longer compatible with those of the research advisor. The student and advisor should discuss any problems with the Director, the Director of Graduate Studies, and/or members of the Executive Committee. If reassignment of the student seems advisable, the Executive Committee will be asked to review the request and, taking into account the wishes and concerns of all parties, will make the reassignment. Almost invariably the student will lose substantial time when changing laboratories and research projects, but if required reassignment is possible.

15. Selection of Dissertation Committee

In consultation with the advisor, each student must select an advisory committee (i.e. Dissertation Committee) that will assist the student and advisor in formulating and executing an appropriate independent research project to fulfill the requirements of the doctoral program. This committee should be formed by the end of the summer after the second year. Each member of the committee must sign the "Dissertation Committee Checklist Form" (Appendix 8) which is then submitted to the DGS for approval. The committee must consist of at least five members of the faculty, including the research advisor. At least four members of the Dissertation Committee (including the thesis advisor) should be members of the Neuroscience Program faculty.

At the discretion of the student and research advisor one faculty member on the Dissertation Committee can be selected from among faculty outside the Neuroscience Program or Emory University. The graduate school recognizes the value of involving faculty who possess expertise relevant to the interest of PhD candidates, but who are located outside the candidates' home departments or programs. The graduate school therefore encourages departments and programs to identify, where appropriate, readers of PhD dissertations drawn from across Emory University or from outside Emory. In the event a reader from outside the University is selected, the dissertation director must supply the resume and a brief letter highlighting the value of the proposed reader on the committee to the Director of Graduate studies who will seek approval from the GDBBS director and Dean of the Laney Graduate School.

The primary function of the advisory committee is to make available to the student a broad range of scientific expertise, to support the research efforts of the student, and help to guide the project to a successful conclusion. The advisory committee is also the primary body responsible for reading and evaluating the doctoral dissertation, and for examining the student in the public oral defense of the doctoral dissertation.

At least one committee meeting should occur during the summer between year 2 and 3, well in advance of the Fall semester deadline for turning in the thesis proposal for the Oral Qualifying Examination. This meeting is particularly important to help set the general scientific direction of the student's written proposal. Thereafter, students are required to have a meeting with the Dissertation Committee at least once a year during training years 1-5, and twice a year during training years 5 and above to review their research progress. This requirement will be strictly enforced, as it provides invaluable assurance that the student is progressing with reasonable expectations. These meetings provide the opportunity for the faculty to provide guidance and assistance that is particularly vital in cases of difficulties of any kind. The student should present a summary of the progress that the he has made as well as an outline of the studies that the student and research advisor anticipate will be included in the final dissertation. The committee will give the student and advisor feedback and comments on what they consider necessary for successful completion of the dissertation research. Any members of the Executive Committee can be present at the committee meetings to monitor the student's progress.

After the committee meeting, the student must complete the Dissertation Advisory Committee Meeting Summary and Progress Report (Appendix 9). This report must provide a detailed account of the discussion of the student's progress and suggestions made during the meeting. The report must be sent to all committee members for approval signatures before being sent to the DGS. Both the advisor and the student must sign this form. If the committee feels that the

student is making reasonable and sufficient progress towards completing the dissertation research, this should be stated. If the committee feels that the student is not making sufficient progress or that there are major issues that need to be dealt with, this should be stated on the form. The Director of Graduate Studies will then transmit this letter to the Executive Committee and they will decide if the Executive Committee or selected members of the Executive Committee should meet with members of the student's Dissertation Committee. If the student's research advisor and/or Dissertation Committee consider the student's research progress to be inadequate for continuation in the program, they can submit a letter to the Executive Committee requesting that the student be terminated from the program. The Executive Committee will consider this request after meeting with the student and in consultation with members of the student's advisory committee and other appropriate faculty and administrative personnel in the Graduate School of Arts and Sciences.

16. Qualifying Examination

The Graduate School requires a student to demonstrate adequate intellectual mastery of his or her field of specialization and of appropriate supporting fields by passing a general doctoral qualifying examination before being admitted to candidacy for the Ph.D. degree. The qualifying exam will be composed of two parts: Part 1 is a written exam to be taken in August between year 1 and 2, and Part 2 is a Thesis Proposal Defense, to be taken during the Fall semester of the third graduate year. In order to be eligible to take part 2 of the qualifying examination, the student must have an overall grade point average of at least "B" (i.e. 3.0) for all graduate-level courses taken prior to the examination, and must have a B- or better in all required courses.

A. Be Prepared.

Students are urged to prepare carefully for the qualifying examinations. Such preparation usually consists of two parts: a review of the principles and facts of neuroscience, cell biology, biochemistry, biophysics, and other basic biomedical sciences, and practice in the oral and written communication skills which will be necessary to pass the examination. Senior students who have already taken the examination can advise on specific exercises, which might be helpful. In preparing for the written examination, some students find it useful to practice writing answers to essay type questions to gain experience in organizing material and giving lucid and concise answers to written questions. Faculty and other students are usually willing to read such practice essays and make suggestions about organization and clarity. Since many students will not previously have experienced an oral examination, a mock oral defense of the written proposal before other students and postdoctoral fellows can be extremely helpful. Each year, Fourth year students, as a part of their *TATOO* requirements in the program, are required to hold these mock exams for the third year students. Students will generally find many people willing to help in their preparation for this important exam.

B. Written Exam.

Part 1 of the Qualifying Exam is a written exam designed to test general knowledge of neuroscience and other basic biomedical sciences laid out in general texts and covered in the two core introductory courses of the Neuroscience Program (IBS 526 and IBS 514). Detailed material given in these courses may change over the years, but each student is responsible only for the specific material covered at the time that he/she attended the course.

All students will take this portion of the qualifying exam simultaneously in August between the first and second year of graduate study.

The written exam will be composed of ten essay and/or problem style questions. The students will be given 10 written questions; they must answer 7 of these questions. They may spend only 8 hours preparing and writing these answers. They will be able to make their own work hours within the limits set and to use calculators, typewriters or word processors, class notes and textbooks; i.e. the exam is "open book." The Emory University Honor Code will be observed throughout. Each year, specific instruction will be issued as to how and when the exam is to be picked up and turned in. The faculty who wrote the questions will grade the answers to these questions. Each grader will assign a grade of 0 - 100% to all questions graded.

The written qualifying exam will require a broad understanding of Neuroscience and will require the students to draw upon information gleaned in all courses, as well as seminars and personal studies. A passing grade on the exam requires an average grade of 75% or above on the total of seven essay questions. Failure to meet these requirements is grounds for dismissal from the Ph.D. program. A student who fails the written qualifying exam may petition the Executive Committee to be allowed to retake the examination. However, the reexamination will be considered on a case-by-case basis and will not be granted in all cases. If granted, the re-examination must be given within 3 months of the original examination. A student may retake the written exam only once.

C. Oral Examination.

Part II of the qualifying exam consists of a written proposal for an original research project and an oral defense of that proposal. The proposal should be based on the project that will ultimately form the student's Ph.D. thesis. The purpose of the exam is to test the student's ability to formulate and defend a worthwhile research project and to test the student's knowledge of the pertinent literature, methodological issues, etc. The purpose of the proposal and defense is not intended to determine the ultimate content of the student's doctoral dissertation. Thus, the student should be less concerned with preliminary data that will convince the committee that the proposed studies will be successful than with knowledge of theoretical and technical issues related to the proposed studies.

(i) Preparation

Each student should begin preparation for this exam by contacting his/her advisor and thesis committee members to let them know that you will require their guidance in preparing the written proposal and its oral defense. Students will be responsible for ensuring that their advisor and two committee members of their choosing are present at their assigned examination time.

The thesis proposal should be written by the student, based on regular discussions with the research advisor. The research advisor may have substantial input into the content of the proposal. However, the proposal should be primarily the student's work. Therefore, the advisor should avoid writing any portion of the proposal, and limit guidance primarily to verbal comments.

Past experience makes it clear that meeting with your advisor and members of your thesis committee prior to the exam can greatly assist you in preparing a successful written proposal and

oral defense. We highly recommend that you schedule to meet with your advisor and thesis committee members on multiple occasions to obtain their guidance and to inform them of your progress.

Students from the 4th year will mentor the 3rd year students. They will work individually or in small groups to help each 3rd year student formulate and/or edit the written proposal. Additionally, the 4th year students will hold a group mock oral examination for each 3rd year student.

(ii) Submitting a Written Proposal

The proposal should be based on the project that will ultimately form the student's Ph.D. thesis. It should be prepared according to the instructions given for an Individual National Research Service Award Application Form (will be provided in IBS 522-Grant writing course)

The following instructions (taken from the General Instructions for PHS Grant Application) are emphasized. Proposals failing to meet these specifications will be returned without review.

- The proposal including all tables, figures, specific aim and research strategies should not exceed 7 pages.
- The proposal should be single sided and single spaced, staying strictly within the following margins: top 1in., bottom 1in., left 3/4", and right 1/2in.
- The proposal should be typed in a print that does not exceed 15 CPI and that does not exceed 6 lines of type within a vertical inch, 12-point font is recommended.
- The proposal should be organized sequentially into subtitled sections as described in the instructions for preparing NRSA proposals discussed in detail in the grant writing course (IBS 522).

The completed written proposal must be submitted to the Director of Graduate Studies at a pre-specified time, typically 2-3 weeks before the oral examination. Proposals will not be accepted after this time. A cover page should identify (1) the title of the proposal and your name, (2) a list of the members of your thesis committee, indicating the two members you have chosen to be voting members during your examination, and (3) the date, time, and place of your exam.

(iii) The Oral Examination

All examinations for the students in a given class will be scheduled during a one to three day period in October at the beginning of the third year. One hour will be allowed for examination of each student. The examination will begin with a presentation by the student that summarizes key elements of the proposal. This presentation is intended to assist the student in gaining comfort and orienting to the proposal; it should be brief, lasting no longer than 5 minutes. The examination committee will then question the student for approximately 55 minutes. The student can expect to receive questions on specific points in the proposal as well as on more general aspects of the subject area of the proposal, such as basic principles, methodology, or the literature. The faculty will have considerable latitude in the style of questioning of the student at this defense.

The voting examination committee will consist of 5 faculty made up of two members selected by the student from his/her thesis committee plus a standing committee of 3 faculty selected to represent a broad range of neuroscience expertise. Note that any member of the standing committee who is thesis advisor or thesis committee member to the student being examined will be substituted. Also present but not voting on the examination will be the student's thesis advisor and the DGS and/or Program Director.

After each presentation, the committee (three standing members and two thesis committee members) and the thesis advisor will discuss the merits of the oral presentation. When discussion has concluded, the thesis advisor will be asked to leave, and the five members of the exam committee will vote individually by secret ballot to pass or fail the student.

The student will be considered to have passed the exam if a simple majority (3/5) of committee members votes to pass. Because of this simple majority criterion, no single vote will result in failure.

Failure to pass the Proposal Defense constitutes grounds for dismissal from the program. However, students who fail the exam may make a written appeal to the Executive Committee if they wish to retake the exam. If the appeal is granted, the student and the Examination Committee can schedule a second Proposal Defense. The Examination Committee will determine whether the second examination will require submission of a revised or rewritten proposal. If a second proposal is required, it must be submitted to the Examination Committee and to the Director of Graduate Studies at least two weeks before the retake of the Defense Proposal. Failure of the student to pass the oral examination by May of the third graduate year will be grounds for termination from the program.

17. Admission to Ph.D. Candidacy

After the qualifying examination, a student may become a candidate for the Ph.D. degree upon recommendation of the student's advisor. Application for admission to candidacy presupposes that all course and qualifying examination requirements have been met and that a plan of study and research covering the entire course of advanced study, including the designation of the advisor, Dissertation Committee and the title of the dissertation, has been approved.

The application should be completed by the qualified students, signed by their advisor, and submitted to the GDBBS office as soon as possible after the successful completion of the oral qualifying examination.

Applications are available as hyperlinks in the Appendix of this handbook but can also be obtained from the LGS website at:
http://www.gs.emory.edu/resources/progress.php?entity_id=5

18. Teaching Assistant Training and Teaching Opportunity Program (TATTO)

The Teaching Assistant Training and Teaching Opportunity Program (TATTO) is administered by the Emory University Graduate School of Arts and Sciences to provide teacher training and experience for doctoral students in the Graduate Division of Biological and Biomedical Sciences

(GDBBS). Completion of the TATTO program is required for the doctoral degree. There are four stages of participation for Division Students.

A. Summer Teaching Workshop

The summer teaching workshop sponsored by the Graduate School (usually scheduled one week immediately prior to the beginning of the fall semester) is the first stage of teacher training. No student may engage in any classroom related teaching activities in his/her training Program until completion of the summer workshop. Normally, Ph.D. students will participate in this Teaching Workshop in the summer following their first year of graduate study at Emory. However, this may be adjusted depending upon an individual student's previous training and academic program.

B. Division Program Experience in "Teaching in the Biosciences"

The Division Program faculty members support the contention that discipline-specific experience and training for their students is best accomplished by requiring their students to enroll and participate in the graduate seminar courses offered by each Program. Student participation in these seminars teaches them to: a) lecture, b) manage discussion, c) evaluate student (peer) writing, d) use audio-visual equipment, e) communicate to undergraduate and graduate (including medical) students, f) prepare research seminars, g) communicate research data to peers, etc. Students in all Programs are required to enroll in the graduate seminar each semester during their first three years in training. Participation in these seminars reinforces material covered in the graduate school summer workshop and addresses subjects and problems particularly related to each specific Program discipline. The Division faculties are firmly committed to assuring that the graduate seminar courses provide each student with ample exposure to, and experience with discipline-specific teaching methods. In the Neuroscience Program, each student is required to participate in Neuroscience, Communication and Ethics Seminars NS 570R and Advanced Graduate Seminar NS 790R during their first two years. These courses require each student to read and assimilate the primary literature in Neuroscience and to present a full-length seminar each semester to one's peers on a particular aspect of the literature. Faculty participates in and guides the seminar. They also provide help to the students in organizing seminars and give help with presentation techniques. Students will be evaluated on their classroom participation or by a variety of criteria that are based on specific activities from the list above in which they engage. Students will receive a S/U grade for their performance in graduate seminars.

C. Teaching Assistantship

All students in the Division of Biological Sciences are currently required to serve as a Teaching Assistant for one semester usually during the academic year immediately following participation in the TATTO summer workshop. Teaching Assistant duties will often consist of serving as a lecturer, laboratory instructor/assistant, and/or a discussion section leader under the supervision of a faculty member. Teaching Assistants will also assist students with problems during scheduled office hours, help with the preparation of handout and/or laboratory materials help administer and grade exams, etc. Students assigned to laboratory courses assist in setting up the laboratory exercises and help students with the theoretical and practical aspects of the exercise as it progresses. The supervising faculty member will submit to

the GDBBS an evaluation of the performance of each Teaching Assistant at the end of the semester of service.

D. Teaching Associateship

Students normally will be eligible to fulfill their requirement for the Teaching Associateship only in their third and fourth year of graduate study. In association with NS 790R, third year students act as mentors for second year students in the course. Mentors will assist second year students in their choice of subject matter, in pursuing the literature, and in organizing their seminar presentations. Most importantly, the mentors will provide second year students with feedback on their seminar presentations.

Fourth year students are required under TATTO Teaching Associateship to mentor third year students through the Oral Qualifying Exam. They must meet with the third year students during the preparation of their written proposal and provide guidance and feedback. They must read the proposal and organize mock oral exams for the students

Students should familiarize themselves with alternative means of satisfying this requirement as provided by GDBBS. They are required to obtain approval from the DGS to pursue one of these alternatives and must nevertheless act as an Oral Exam Mentor.

19. Dissertation Research

Probably, the most important aspect of a student's training program is his or her thesis research. Most other aspects of the program are designed to lead up to and provide preparation for this research work. Normally this research will begin no later than the second summer in residence.

The work must be an original contribution to scientific knowledge and should be of a quality that will allow its publication in a peer reviewed scientific journal. Generally, thesis work will be performed on site at Emory. Completion of thesis work at other institutions will require the explicit approval of the Executive Committee.

It is expected that the student has at least one published or accepted original research manuscript as first author from their dissertation work published in a peer-reviewed journal.

Under exceptional circumstances, the thesis committee may decide not to apply this requirement (expectation) if it judges that the quality and content of the body of work equals that of a peer-reviewed publication and that the work represents a significant contribution to the field.

20. Submission of Ph.D. Dissertation

A. Approval of Committee.

When the candidate and advisor agree that the project is nearing completion, a meeting of the Dissertation Committee is held to discuss the acceptability of the completed research. Approval of the committee should be obtained prior to writing the dissertation.

B. Guidelines for Writing and Submission.

The general format of the dissertation includes the following sections: abstract, introduction, historical background, methods, results, discussion and references. Each section can encompass one or more chapters as appropriate. At the discretion of the Dissertation Committee and Program Director scientific papers on which the student is first author and which have been published in refereed journals may represent some of the methods, results and discussion. More detailed directions as to the form of the dissertation are available from the Graduate School Website - http://www.graduateschool.emory.edu/resources/progress.php?entity_id=7. One copy of the dissertation is printed, but the dissertation is submitted electronically.

C. Submission of the dissertation.

After the dissertation has been read and approved by the thesis advisor, the student must give a copy to all members of the thesis committee and to the Director of Graduate Studies. The dissertation must be complete at this time, including figures and references. The Director of Graduate Studies will verify that the dissertation meets all graduate school requirements. **No sooner than two weeks** after distribution of the dissertation a final thesis committee meeting must be held. This procedure should give committee members enough time to read the dissertation thoroughly before the meeting. **The Director of Graduate Studies must be notified of the time and location of this meeting.** He or she or his/her designated representative from the executive committee will attend the final thesis committee meeting. Recommendations for changes to the dissertation by committee members and revisions of it by the student can be made prior to the final thesis committee meeting.

D. Final thesis committee meeting.

The purpose of this meeting is to insure that the student has a defensible dissertation of high quality before the oral defense date is scheduled. The DGS or his/her designated representative from the Executive Committee will chair the meeting. All members of the thesis committee must give provisional approval of the dissertation in writing (Appendix 10). Once unanimous provisional approval has been given, the oral defense can be scheduled and announced. **The oral defense cannot be scheduled sooner than two weeks after signature of the provisional approval form,** and must be at a time when all members of the thesis committee can be present. These two weeks are necessary to give the program and the graduate school sufficient time to advertise the thesis defense. The time and location of the defense and an abstract of the thesis must be provided the Director of Graduate Studies and to the administrator of the Neuroscience Program, who will advertise the defense. The cost of preparation of the dissertation is borne by the student.

It is the candidate's responsibility to find a date, time and location for the dissertation defense that is appropriate for the thesis defense and to notify the committee and faculty in writing, the Program Coordinator can provide location assistance if needed. Although most dissertation defenses require less than two hours, a three-hour period should be scheduled should additional time be necessary.

It is recommended, but not required, that students have a reader of their dissertation from outside Emory who is familiar with the field of research. They should be invited to the final thesis committee meeting, if possible, and to the oral defense. The purpose of such an outside

examiner is to raise the bar a bit by having an unbiased examiner who is an expert in the field. The implementation of this may seem unnecessary or cumbersome to some, but it has been rewarding in the past.

21. Defense of Ph.D. Dissertation

As a final requirement for obtaining the Ph.D. degree, the candidate must orally defend the dissertation before the Dissertation Committee and other interested faculty and students. A copy of the thesis should be made available in the Division Office a week before the defense. The Director of Graduate Studies must receive written notification of a thesis defense and the Program Coordinator must announce the public seminar by sending a written notice to the neuroscience listserv and GDBBS office two weeks prior to the defense. The DGS or his/her designated representative from the Executive Committee will chair the thesis defense. The thesis defense will consist of a public seminar with public questioning at the end, followed by private deliberations between the student and his/her thesis committee. The committee will then meet privately to assess the success of the defense. The DGS will be present and chair all aspects of the defense and its deliberations but will not be involved in the assessment of the thesis and its defense. The thesis research and a written thesis meeting all Graduate School requirements must be completed and defended before the Dissertation Committee by the end of the student's seventh year.

A. Public Dissertation Defense

The public dissertation defense is a formal scientific seminar. The atmosphere should be one that encourages critical questioning so that the student can demonstrate their expertise in an open forum. The DGS or his/her designated representative from the Executive Committee will chair the thesis defense. Care will be taken to preserve the formality of the occasion. At no time should the student or members of the audience be lead to believe that a pass is automatic. The chair will outline the format of the defense and introduce the thesis advisor. The advisor will introduce the student and their research in a manner similar to other seminars. The advisor and the student should avoid personal comments as well as mention of subsequent parties at this time. Personal comments, congratulations and acknowledgements are more appropriate for the celebration following a successful completion of the oral defense. The defense consists of a short (40 - 50 min) oral presentation by the candidate of a summary of the project. After the student's presentation the chair will invite questions from the audience. The committee and other members of the faculty will question the candidate on matters related to the dissertation research to assess the thoroughness of the candidate's knowledge and the quality of the work. The candidate is expected to be an authority in his or her research area, and successful defense of the dissertation requires the oral demonstration of that expertise.

B. Private dissertation defense

Following the public defense, the DGS or his/her designated representative from the Executive Committee will chair the private defense in an administrative capacity. At this time any issues brought up at the public defense and any other questions that thesis committee deems appropriate should be addressed. At no time should the advisor answer questions posed to the student. After the student has been dismissed, the student's performance will be discussed and evaluated by the committee. All committee members must confirm in writing that the student has successfully defended the dissertation. The appropriate form is available on the

Graduate School Handbook web site. **The student is responsible for providing the committee with the form** (http://www.gs.emory.edu/resources/progress.php?entity_id=7).

C. Revisions

In general, all revisions to the dissertation should be made prior to the defense. A final copy of the revised dissertation should be made available to interested faculty who are not on the Dissertation Committee one week prior to the final defense. However, if revisions have not been made in a satisfactory manner, as judged by the committee, final approval of the dissertation will be delayed until the appropriate revisions have been made and reviewed.

22. Awarding of Degree

A. Deadlines

The Graduate School has several deadlines that must be met by the candidate during the semester in which the degree is to be awarded. These deadlines include: 1) last day to file application for degree; 2) last day for receipt of Degree Clearance Reports for Master's and Doctoral candidates (note: theses and dissertations must have final approval and dissertations must be defended prior to this date); 3) degree candidate's theses and dissertations due in the Graduate School Office. These deadlines are published in the Academic Calendar of the Graduate School Bulletin and most forms are due early in the semester. Students are advised to complete the forms at the beginning of the semester in which they intend to defend.

B. Degrees

The Program in Neuroscience offers programs for two degrees: The Master of Science (M.S.) and the Doctor of Philosophy (Ph.D.). The program of study is primarily designed for the Ph.D. degree. Students seeking only the M.S. degree are not accepted. Under certain circumstances, a student may be permitted to work for a terminal M.S. degree that requires submission of an appropriate thesis.

(i) Master of Science.

A student who fails the oral Qualifying Examination may petition the faculty for permission to complete a Master's thesis. In addition a student who passes the oral qualifying examination, but due to unforeseen personal and/or academic reasons cannot complete the doctoral program may request permission to complete a Master's thesis. If the petition is approved, such a student must form a Master's Thesis Committee of a faculty advisor and a minimum of two additional members of the Neuroscience Program Faculty. It is the student responsibility to identify a Faculty advisor willing to host and supervise the research. The student must complete a research project approved by the committee and write a Master's thesis. The general format of the thesis is the same as for the PhD dissertation, except that the content needs not to be as extensive. The research must, in the judgment of the Dissertation Committee, be scientifically rigorous and of sufficiently high quality that it contributes new scientific knowledge. After the thesis has been read and approved by the advisor, the student must give a copy to members of the committee and to the Director of Graduate Studies. The thesis must be complete at this time, including all figures and references. Members of the committee will then have two weeks to read and evaluate the thesis. As a final requirement for obtaining the MSc degree, the candidate must orally defend the thesis before the Committee. A public thesis defense is not required for a Master's degree. The DGS or his/her representative will chair the thesis defense.

It is the student's responsibility to setup a date and find a location for the defense, based on the availability of the thesis committee members and the DGS. If necessary, the Program Coordinator can help in this regard. The main purpose of this committee defense is to assess the candidate's knowledge of the thesis content and/or further clarify scientific points that the thesis committee members may deem appropriate. After questioning, the student will exit the room while committee members discuss their performance. A minimum of three committee members (including the advisor) must confirm in writing that the student has successfully defended the dissertation. The appropriate forms are available on the Graduate School Handbook website. The student is responsible for providing the committee with the forms.

(ii) Doctor of Philosophy.

When a student has completed all of the course requirements, and has submitted and successfully defended his or her Ph.D. dissertation, the Director will submit the appropriate form to the Dean of the Graduate School. However, formal application for a degree must be made at the beginning of the semester in which the degree is to be conferred. In addition, the student must be registered during the semester in which the degree is to be conferred.

23. Tenure of Graduate Studies

Students and their advisors should aim for completion of their graduate studies within a period of five to six years. MD/PhD students should aim for completion of the program within four to five years after beginning the graduate school portion of their studies. Most graduate students should be able to complete their dissertation research and defense within this period of time. Each Spring 2-3 members of the Executive Committee meet with each student in year 5 and above to discuss their progress in the program. If there are difficulties, usually during this time those issues surface. If it becomes evident to a student, an Executive Committee member or his or her advisor that successful defense of the dissertation cannot occur before August 31 of the sixth year, the student must submit a formal petition to the DGS for an extension of this time limit. This petition should be in writing and should include a statement as to the reason for the student's inability to complete the program within 6 years and a clear justification for the extension. The deadline for submission of this request is January 1 of the student's sixth year in the program (or fifth year for MD/PhD students.) Also, the petition should include a projected date for the defense. When considering the petition, the DGS may consult the Executive Committee and will consult with members of the student's Dissertation Committee to determine whether they consider the projected date of the defense to be realistic and attainable.

24. Expectations of Performance

A. Expectations of Faculty for Students.

Students are expected to perform satisfactorily in required and elective course work. In most cases, this includes active participation in classroom and seminar discussions as a way of contributing to the scientific environment of the University and to the development of the student. Students are also expected to actively participate in the various events and seminars sponsored by the Program or the local chapter of The Society for Neuroscience. Students should be motivated to continually develop their scientific independence and creativity. This is demonstrated by active interest in and knowledge of the current scientific literature and by planning and performing original research. It is expected that the student's research results will

be published as an independent contribution to the literature. To accomplish these goals, students need to acquire and develop written and oral communication skills.

Students are also expected to make continuing progress through the program. This includes selection of an advisor and Dissertation Committee in a timely fashion and submission and defense of the dissertation soon after completion of laboratory research. It is anticipated that most students will complete the graduate program within 5 years. Graduate school policy mandates that students must successfully defend their dissertation within 8 years of entering candidacy. Development as a scientist is usually not attained in a regular 40-hour workweek. Students are encouraged to show a dedication and enthusiasm for their research projects and to continually strive for the excellence and discipline that will make them competitive in the modern scientific world. In doing so, previous students from Emory programs have secured attractive positions in academia, in biotechnology industries, and in government.

Students should be familiar with the regulations governing University-student relationships and with the Graduate School Honor and Conduct Codes as published in the Graduate School Bulletin.

For a variety of reasons a student may find it necessary to take a brief leave from their course work or laboratory rotations. In these cases the student should notify their advisor (in the first year the advisor is the DGS) and course instructors and/or rotation supervisors. Formal leave of absence should be requested in writing to the Director of Graduate Studies. Students must refer to the GSAS handbook for the protocol.

B. Expectations of Students for Faculty.

Students may expect the faculty to enthusiastically give their time and expertise. This is done both in terms of presenting well-prepared, current formal courses and by providing individual instruction and consultation in the laboratory such that students can maintain progress in their research. The faculty provides laboratory space, equipment, and financial support so that students in training can conduct their research. In many cases, student stipends are also provided directly by individual faculty members' research grants. Importantly, faculty should serve as professional role models and encourage and advise students to fully develop their scientific talents. As part of providing a stimulating scientific environment, the faculty actively participates in the Frontiers in Neuroscience Seminar Series. Finally, faculty should counsel students in determining the direction their postdoctoral careers might take.

Faculties are also expected to provide reasonable and clear guidelines for the graduate program and to administer Graduate School requirements at the Program level. Student grievances and appeals should be addressed directly to the Program Director, Director of Graduate Studies, or members of the Executive Committee.

25. Student - Faculty Communication

Students usually have questions and suggestions about many aspects of the graduate program that can assist the faculty in achieving and maintaining a high quality-training program. Student feedback about all aspects of the program, and particularly about courses, is very important in helping the faculty recognize the strengths and weaknesses in the current program. Student-faculty communication is, therefore, strongly encouraged, and students are urged to make their views known to the faculty. Although faculty try to request feedback, when they do not hear

from students they often assume that there are no problems in the current program. Student representatives to the Executive Committee are particularly effective liaisons between the faculty and students and have been catalysts for important reforms in the program administration and curriculum. The students should make wise use of these effective representatives.

The student's advisor or members of his or her dissertation committee are in the best position to discuss research or personal issues. The Director, the Director of Graduate Studies or members of the Executive Committee are first choices to approach about procedure and policy questions. However, all faculty attempt to be readily available to meet with students within the restrictions of their schedules. If a faculty member cannot see a student immediately, he or she will make an appointment to meet with the student at the earliest available time. Please use the faculty as a resource.

If the student wishes to discuss non-academic personal issues, an Emory University Health service is available to all graduate students.

Stipends and tuition fellowships awarded to students on the basis of academic merit are intended to cover basic living expenses and tuition. With the exception of special awards, such as the Woodruff Fellowship, stipend levels are set by the Division based upon the availability of funds from Graduate School and university sources. The faculty also encourages and assists students in obtaining individual stipend support from extramural sources, such as federal agencies and private foundations. Students who obtain their own extramural funding from major nationally competitive grants are awarded a $2,000 increase in their stipend level by GDBBS. Neuroscience Students have been fairly successful at obtaining funding by submitting their Oral Exam proposal to NRSA.

It is the policy of the Division to continue support for 21 months for a student in good standing working for a Ph.D. Financial support after the 21 months in residence is the responsibility of the student's thesis advisor. Typical sources of support after the third year are from research grant funds of the student's advisor or individual fellowships awarded to the student. GDBBS provides a safety net for the support of students (beyond the second year) in good standing whose advisors have lost research support for their students.

Financial support may be withdrawn from students whose performance in the graduate program is unsatisfactory as stipulated in the sections above. Financial support is normally provided only to full-time students working toward the doctoral degree.

26. Policy Regarding Outside Employment

Stipend and tuition fellowships are awarded to allow students to devote full time to the graduate program and complete the requirements for the Ph.D. degree in as short a time as is consistent with adequate training and research progress. The student should not engage in additional employment while receiving a stipend through the graduate program, regardless of the source of that stipend. Such outside employment generally causes a serious distraction from the educational process. Graduate education and research are by necessity largely self-motivated processes, and the distractions of outside employment can interfere with the ability of students to prepare satisfactorily for their future professional careers. The sooner that a student finishes the training program the sooner he or she can receive a salary in a postdoctoral position.

If additional income is absolutely necessary, students are encouraged to consider the possibility of low-interest student loans. Advice about such loans can be obtained from the financial aid office of the University. If a student feels strongly that outside employment is necessary while in the graduate program, the student must discuss the need with his or her advisor and submit a formal request to the DGS who may consult with the Executive Committee, at least 30 days in advance of beginning employment. The petition must be fully supported and signed by the student's advisor. However, students should be aware that such requests will only be granted if it is deemed appropriate and will further the student's ultimate career goals. Also, such requests will normally be considered only for students in Advanced Standing. If outside employment is necessary and allowed by the Executive Committee, the student must not allow it to interfere with high standards of performance or with attendance required courses such as NS 790r or at Frontiers in Neuroscience.

27. Leaving the Program

A. Beyond the Ph.D.

The question of what direction a student's career will take following completion of the doctoral training program should arise early and become increasingly important as training progresses. It is never too early to begin to consider career options and to plan a curriculum accordingly. It is common for students receiving the Ph.D. to take a postdoctoral research training position in order to pursue a specific research interest as well as to acquire additional techniques and expertise to prepare them further for a career of independent research. Such postdoctoral training is especially valuable and is usually essential for a career in academic biomedical research. Some students take permanent positions in industrial or government research laboratories immediately after receiving the Ph.D. degree. Some decide to enter other advanced degree programs, such as medical school or law school. Career objectives can best be realized through the careful planning of a student's graduate training program. The Director, Director of Graduate Studies, Executive Committee, and all members of the faculty stand ready to advise students on career options. Students are strongly encouraged to seek this advice at any time during their training.

B. Poor Performance.

The Director of Graduate Studies, who may consult with the Executive Committee, will review the progress of students once each semester, or more frequently if warranted. All students must meet the Graduate School's definitions of good standing and due progress to continue in the program. Degree candidates must also be conducting satisfactory research as judged by the advisor and dissertation committee. Students who are experiencing difficulty in the program are strongly encouraged to seek assistance at their earliest opportunity from the Director, Director of Graduate Studies and members of the Executive Committee, their advisor, or other faculty. Every effort will be made to assist students in meeting the performance standards, which are required for continuation in the program. However, a student who does not maintain an adequate standard of work or make due progress will be placed on probation, and financial support may be withdrawn. The student will be informed in writing of the conditions of the probation, and a timetable for elimination of the probationary status will be

established. A student who fails to meet the conditions of the probation will not be allowed to continue in the program.

A student who fails either part of the doctoral qualifying examination is considered not to be making due progress and may be dismissed from the program. Such a student may petition the faculty to retake the examination if the student believes that the conditions that adversely affected his or her performance may expeditiously be rectified (see section XI). A student who fails the reexamination will be terminated from the program. Appeals of the Executive Committee's decisions in these matters may be made to the Graduate School, as outlined in the Graduate School Bulletin.

28. University Requirements

Every effort has been made to make this document as accurate and complete as possible. Formal University requirements are detailed in the current issue of the Bulletin of the Graduate School of Arts and Sciences, and are in addition to those detailed in this document. Policies are subject to change without notice.

29. Leave of Absence

Official rules are that you need to take a Leave of Absence after 15 Calendar Work Days of absence (3 weeks). HOWEVER, given the unique flexibility in timing of various endeavors associated with doctoral research projects there may be reasonable latitude in preventing or delaying a leave of absence. For example, much scholarly research and writing can be undertaken away from the lab. Given the timing/nature of the project, and mentor-mentee relationship, longer periods away from the laboratory may be viewed as agreeable prior to triggering a leave of absence. Frank discussions with your mentor, the Neuroscience Program and GDBBS leadership are encouraged to manage this difficult situation.

A. Leave Requests

To request a Leave of Absence (LOA) or Withdrawal students should meet with their DGS, who must sign the official forms. Students must also meet with the DGS to request Readmission after an LOA. All forms must be sent to the GDBBS for approval by the GDBBS Director. Monica Taylor in the Division office is available to assist with the LOA or withdrawal process. She may be reached at Monica.Taylor@emory.edu or at 727-2678.

(i) Effect on Health Insurance and Salary – What you need to know

Students on unpaid leave are not considered registered students. You will only receive health insurance and continue to receive your student stipend until the end of the semester you go on leave. You can only return at the start of a semester. Thus, if your illness extends into an additional semester you will have no incoming salary and no health insurance for an entire semester. **Therefore, in as much as possible, strategies should be explored to minimize the possibility of a leave of absence extending into an additional semester** Information provided in handbooks from the Laney Graduate School and GDBBS

(ii) Laney Graduate School Rules on Leave of Absence

You are limited to two one-year leaves of absence. The official Request for a Leave of Absence does not ask you for the reason you are requesting a leave. We encourage you to discuss those reasons as well as your plan for returning with your advisor and/or Director of Graduate

Studies. You and your program may wish to create a written record of those discussions, to be kept by your program. Obtaining a leave of absence will affect your health insurance coverage as well as stipend payments (if applicable). The rules are a little complex and how you will be affected depends on when your leave takes effect. Ask your program administrator and graduate school staff and be sure you know exactly how these important areas will be affected. You can return only at the start of a semester.

(iii) GDBBS Additional Leave of Absence Information

Requests for an unpaid Leave of Absence for any student must adhere to Laney Graduate School guidelines (LGS Handbook), must be approved by the Program Executive Committee of the student's Program, and then forwarded to the GDBBS office for the Director's approval. The Dean of the Laney Graduate School must give the final approval for any leave.

Students on unpaid leave are not considered registered students and will only receive health insurance until the end of the semester in which they go on leave (as long as they go on leave after the date of record for that semester). If the leave extends into the next semester the student is eligible to purchase health insurance coverage under COBRA guidelines. Students may only return from a leave at the beginning of a semester.

Return from Leave of Absence: The student can come back at the start of a semester before the year is up. The re-admit paperwork should be turned in a month before the student wants to return.If this has been an ongoing illness the student is experiencing, the student's illness should be documented by the Office of Disability Services.

(iv) Office of Disability Services http://www.ods.emory.edu/

This office determines what level of accommodation if any should be extended to the student. This third party evaluation puts objectivity into the situation and also protects the student's privacy. It does not excuse poor performance. It only determines what is fair so that a student can continue to get the job done. The process usually does help the student to see that he/she may have unreasonable expectations about what the advisor should do. The advisor will know as well if he/she is being fair to the student.

30. Appendices

Appendix 1. Essential Forms

There are a ridiculous number of forms and guidelines with understandable confusion as to what needs to be done, when, for whom and why. For your convenience, a list of all the forms/guidelines is provided below. Included are explanations/requirements, where to deliver forms, and Hyperlink to each form for download.

ROTATION PROPOSAL

Outlines a brief summary of your proposed rotation project. The form should include overall goals and the approximate number of hours you plan to spend in the lab each week. The form should be completed and returned to DGS #1 (Victor Faundez) at least one week before starting each rotation. (Rotation_Proposal_Form)

ROTATION EVALUATION (UNDERTAKEN BY ROTATION MENTOR)

This is an evaluation of the overall rotation project including achievements and student's overall performance by the mentor. The form should be completed and returned to DGS #1 (Victor Faundez) no later than one week after completing the rotation. (Rotation_Evaluation_Form)

ROTATION REPORT GUIDELINES

Rotation Reports are short manuscripts that detail your hypothesis/goal, experimental accomplishments, and data interpretation. Reports should be prepared irrespective of whether any or all of the experiments conducted during the rotation yielded positive results. The objectives of this report are to, (i) allow the student to critically reflect on the rotation project, (ii) evaluate the relevant literature, identify an unsolved problem, and formulate a hypothesis/procedure to be tested, and (iv) generate a detailed record of the experiments performed during the rotation. Rotation reports must be submitted to DGS #1 (Victor Faundez) following each rotation.
(Neuroscience_Program_Rotation_Guidelines)

GDBBS MENTOR AGREEMENT FORM

Upon completion of rotations and selection of a mentor, this form should be completed and given to the Program Coordinator (Gary Longstreet). The purpose of this form is to validate and secure the agreement including financial support between the student and mentor through their dissertation project. (GDBBS_Mentor_Agreement_Form)

NS DISSERTATION COMMITTEE CHECKLIST

The purpose of this form is to outline steps in selecting a Dissertation Committee. The form insures that the committee is committed to serving on your committee including attending scheduled meetings, assisting and consulting with the creation and the duration of an original research project, and that all of the members meet the requirements of the program. This form should be given to the Program Coordinator (Gary Longstreet) (NS_Dissertation_Committee_ Checklist**)** *Note: This form is used for NS Program internal-only purposes and should not be confused with the LGS Dissertation Committee Form (see below).*

LGS DISSERTATION COMMITTEE FORM

This form lists each dissertation committee member and requires original signatures. At least three committee members must be Emory faculty and outside committee members require separate approval. The form is be completed at the end of year 3 but is due no later than August 1st before the student's fifth year of study. This form should be given to the Program Coordinator (Gary Longstreet).
(LGS_Dissertation_Committee_Form)

APPLICATION FOR CANDIDACY

Candidacy is an important milestone in the progress towards the PhD degree. It indicates that the student has achieved a substantial level of expertise in his or her field, and has articulated a plan for independent research and writing that has been approved by the faculty of his or her program. Candidacy is currently reached at the end of student's third year. The form is due no later than August 1st before the student's fifth year of study. This form should be given to the Program Coordinator (Gary Longstreet). (Application_for_Admission_to_Candidacy).

DISSERTATION ADVISORY COMMITTEE MEETING SUMMARY AND PROGRESS REPORT

The purpose of this form is to summarize and document each dissertation committee meeting. Both the student and Committee chair should complete the form immediately after each meeting. As a reminder, students should meet with their committee annually. Students in Years 5 and above are required to meet twice a year. Completed forms should be returned to the DGS for Advanced Students. This form should be given to the Program Coordinator (Gary Longstreet). (Dissertation Advisory Committee Meeting Summary and Progress Report**)**

PROVISIONAL DISSERTATION DEFENSE APPROVAL FORM

The Provisional form verifies that all members of the student's committee have read the dissertation and the student may proceed and schedule their defense. The form should be signed at the final committee meeting by all members of the committee. It should be noted that the DGS or Neuroscience Program Director must attend all final committee meetings. This form should be given to the Program Coordinator (Gary Longstreet). (Provisional_Dissertation_Approval_Form).

DEGREE COMPLETION

If you are approaching the end of your degree program, there are several forms you need to complete in order to receive your degree, and some important guidelines, instructions, and checklists you should refer to as you prepare your dissertation or thesis for submission:

Application for Degree

This form must be completed by the application deadline for the semester you plan to graduate. (Application_for_Degree)

Report of Completion

This form indicates that you have successfully defended and completed all of the requirements for the PhD. **Special Note: BRING THIS FORM TO YOUR DEFENSE. All committee members must sign the Report of Completion**. (Report_of_Completion_of_Requirements_for_Doctoral_Degree)

Submitting your Dissertation

This document outlines instructions for submitting your dissertation.

*****Note: BRING THIS FORM TO YOUR DEFENSE. All committee members must sign the cover page of the Dissertation**. (Instructions_for_Submitting_Your_Thesis_or_Dissertation)

Appendix 2. Typical Schedule Neuroscience Students

Course number	Course Title	Credit hours
YEAR 1-FALL SEMESTER		
IBS-526	Neuroanatomy and Systems Neuroscience	7
IBS-530R	Frontiers in Neuroscience	1
NS-551	Techniques in Neuroscience	1
NS-570R	Professional Development, Communication, and Ethics	2
NS 597	Laboratory rotation	1
YEAR 1-SPRING SEMESTER		
IBS-514	Cellular, Molecular, Developmental and Translational Neuroscience	7
IBS-530R	Frontiers in Neuroscience	1
NS-570R	Professional Development, Communication, and Ethics	2
NS-597	Laboratory rotation	2
YEAR 1-SUMMER		
RES 999GSAS	Graduate Residence	9
	WRITTEN QUALIFYING EXAM	
YEAR 2-FALL SEMESTER		
IBS-530	Frontiers in Neuroscience	1
NS-790R	Advanced Graduate Seminar	2
IBS-699R	Advanced Graduate Research	Variable (make up semester to 9 cr)
XXXX	Elective course(s) (one or more)	Variable (total of 4 cr or more)
TATT-600	TATTO (Teaching mini-course)	0
YEAR 2-SPRING SEMESTER		
IBS-530	Frontiers in Neuroscience	1
IBS-522R	Grant writing	4
IBS-538	Design and Analysis of Experiments	4
IBS-699R	Advanced Graduate Research	Variable (make up semester to 9 cr)
XXXX	Elective course(s) (one or more)	Variable (total of 4 cr or more)
YEAR 2-SUMMER		
RES 999GSAS	Graduate Residence	9
YEAR 3-FALL SEMESTER		
IBS 699R	Advanced Graduate Research	9
	ORAL QUALIFYING EXAM	
YEAR 3-SPRING SEMESTER		
IBS 699R	Advanced Graduate Research	9
YEAR 3-SUMMER		
RES 999GSAS	Graduate Residence	9
YEAR 4 AND ABOVE		
NS-799R	Dissertation Research	9

Appendix 3. Elective Courses for Neuroscience Students

Electives Strongly Recommended for Neuroscience Program Students

IBS504	Introductory Prokaryotic Genetics	4	Fall
IBS 506R	Basic Mechan. of Neurolog. Diseases	4	Spring
IBS 531	Principles in Pharmacology	4	Fall
IBS 532	Introduction to Pharmacology	3	Spring
IBS 534	Computational Neuroscience	4	Spring
IBS 535	Behavioral Neuroendocrinology	3	Fall
IBS 536	Drug Metabolism and Toxicology	2	Spring
IBS 556	Basic Biological and Biomedical Sciences	6	Spring
IBS 566	Drug Development	3	Spring
IBS 701	Cell Surface Receptors	3	Fall (even numbered years)
IBS 702	Mol. Mechanisms of Signal Transduction	4	Fall
IBS 703	Current Topics in Behav. Neuroscience	2	Spring
IBS 707	Biology of Movement Control	4	Fall
IBS 717	Neuropharmacology	4	Fall (odd numbered years)
IBS 750	Molecular Neurobiology	4	Fall (even numbered years)
IBS 770	Brain Repair	4	Spring
PSY 770	Topics in Cognitive NS	3	Spring
PSY 720	Behave Effects of Drugs	3	Spring (even years)
EOH 523	Neurotoxicology	2	Spring (even years)

In consultation with the student's research advisor other courses may be taken as electives.

NOTE THAT SOME OF THESE COURSES ARE NOT OFFERED EVERY YEAR. PLEASE, CONSULT THE DGS TO GET AN UPDATED LIST OF ELECTIVES OFFERED DURING THE SEMESTER YOU INTEND TO ENROLL

Appendix 4. Survival Skills Checklists and Career Guide

Checklist_Survival_and_Career_Guide

Rotation Mentor Questions

- ☐ **Are you currently taking students/ would you have funding to support me should I choose your lab for a dissertation?**
- ☐ **How many graduate students have you trained and how long did it take them to graduate?**
- ☐ **What projects are you currently working on? How much freedom do I have to customize my research interests?**
- ☐ **Who would be training me? How much contact time do you normally have with students?**
- ☐ **What are your expectations of me; (i) during a lab rotation? (ii) as a doctoral student?**
- ☐ **How many other students have you mentors and what are they doing now?**
- ☐ **How do you help students develop their research skills and hone independence in the lab? What are your views on professional career development outside the lab?**
- ☐ **How would you describe the environment of your research group inside and outside the lab?**
- ☐ **What are the rules for attendance and presentation at scientific meetings?**

Time management and Productivity

- ☐ **Acquire a regular sleep schedule and maintain a regular exercise routine.**
- ☐ **Use a calendar wisely: Schedule regular meetings. Structure time blocks for study time, extracurricular activities and days you plan to be inside the lab.**
- ☐ **Use checklists to prioritize daily and weekly schedules with realistic goals. Break down each large assignment into small parts.**
- ☐ **Pomodoro technique (http://en.wikipedia.org/wiki/Pomodoro_Technique): Use a timer to define work tasks. When you need to focus on a task, set up a timer for a reasonable amount of time, have a pad of paper and pen, and begin working. If another task pops into your mind (e.g. ideas, remembering to e-mail someone) write that task on your piece of paper and perform all of them after your timer goes off.**
- ☐ **Know thyself: Find the time of day and/or environment in which you work the best. Save your most difficult work for the time when you are at your peak productivity.**
- ☐ **Optimize work environment: Set up a workspace that optimizes productivity. Pick your study partners wisely.**
- ☐ **Spend less time messing around on the internet. Identify and restrict times for social networking (e.g. only read emails and look at Facebook pages at set times during the day).**
- ☐ **Remember that rest and play are important for good mental health and creativity.**

GOOD LABORATORY PRACTICE

- ☐ **Get to know your area and were supplies are kept.**
- ☐ **Take safety rules seriously and report accidents or unsafe situations.**
- ☐ **Clean up after yourself.**
- ☐ **Determine the general lab structure.**
- ☐ **Learn everyone's name.**
- ☐ **Respect others' time and space.**
- ☐ **Label everything utilizing naming conventions established in the laboratory.**
- ☐ **Identify the person you should go to for help and to ask questions.**
- ☐ **Help others in need.**
- ☐ **Use checklists for routine methodological procedures to prevent critical errors.**

LABORATORY RULES FOR SUCCESS

- ☐ **Treat all members of the lab with the same respect you give the PI.**
- ☐ **Be a good lab citizen: clean-up after yourself, take your turn when doing common tasks.**
- ☐ **Attend all laboratory meetings to learn content area and support lab mates.**
- ☐ **During dead time in the lab, read the relevant literature. Resist the temptation to read non-science material.**
- ☐ **Write down detailed notes when learning new skills/equipment.**
- ☐ **Data management: Keep a detailed and accurate lab notebook record of your experiments (even when results are negative). This includes experimental design, protocol, calculations, and detailed summary of observations/results. Lab notebooks are the property of the university and must stay in the lab. Never delete data!**
- ☐ **Plan experiments thoughtfully (trash in = trash out): Carefully define the question through reading the literature and discussions with others. Choose proper controls. Consider sample number.**
- ☐ **Build a reputation for being a careful, thoughtful scientist by asking questions, reading the literature and demonstrating critical thinking.**
- ☐ **Establish authorship on manuscripts early to avoid conflict.**
- ☐ **Use checklists as an organizational tool to identify important experiments and plan logical steps towards completion of a research goal (e.g. figures for a publication).**

ATTITUDE DESIDERATA

- ☐ **Try to see things from other people's perspectives, remembering that we are all human.**
- ☐ **Learn people's names and get to know people around you.**
- ☐ **Thank people when they do even small things that benefit you.**
- ☐ **Compliment others to encourage mutual positive interactions.**
- ☐ **Consider cultural factors in yours and others actions and how this affects your interpretation of actions.**
- ☐ **Smile. Make eye contact when speaking with people.**
- ☐ **Explore new areas to expand your own interests and be more interesting.**
- ☐ **Provide constructive critiques with the focus on improvement.**
- ☐ **Treat people courteously and with respect, even in a disagreement.**

RESEARCH COLLABORATIONS

- ☐ **Communicate openly and frequently with collaborators to be sure everyone is informed.**
- ☐ **Establish authorship on manuscripts early to avoid conflict.**
- ☐ **Keep deadlines for expected work accomplishments with collaborators.**
- ☐ **Capitalize on opportunities to highlight your contributions to the research effort (e.g. offer to present your work at group meetings).**
- ☐ **Be enthusiastic about others' work and try to ask good questions at group meetings.**
- ☐ **Be punctual: Arrive on time for all meetings.**

NETWORKING

- ☐ **Be a social butterfly. Go meet, talk, repeat.**
- ☐ **Develop relationships with individuals that are networking hubs (typically extroverts that know many people in several professional circles).**
- ☐ **Practice your elevator talk.**
- ☐ **Get involved in local associations.**
- ☐ **Ask for contact information (e.g. business cards) and write notes that remind you of the interaction. Follow-up with additional communication to solidify connection.**
- ☐ **Be punctual.**
- ☐ **Make eye contact and engage the other person when being introduced.**
- ☐ **Communicate openly and frequently with collaborators so everyone is informed.**
- ☐ **Establish authorship on manuscripts early to avoid conflict.**
- ☐ **Keep deadlines with collaborators.**

CAREER OPTIONS: PROPOSAL DEVELOPMENT AND GRANT WRITING CONSULTANT

PROS

- ☐ **Own boss: set own salary, flexible work/family balance: pick clients.**
- ☐ **Projects have a finite time commitment.**
- ☐ **Intellectual stimulating: learn new subjects areas.**
- ☐ **Keeps abreast of latest technological advance in writing (software, graphic design, ehealth, etc).**
- ☐ **Use online learning to expand skill set.**

CONS

- ☐ **No regular pay check.**
- ☐ **Can take years to build reputation.**
- ☐ **Distant from hands-on science and energy of working with a team.**
- ☐ **No longer expert in subject of training---know little about many different topics.**
- ☐ **If have PhD and working with scientists, they assume that you are an expert in <u>their</u> filed.**

CAREER OPTIONS: PATENT AGENT/BIOTECHNOLOGY CONSULTANT

PROS

- ☐ **At forefront of science/technology commercialization.**
- ☐ **Observe application of science impacting population.**
- ☐ **Flexibility in work schedule.**
- ☐ **Diversity of work with different clients**
- ☐ **High activity/energy.**

CONS

- ☐ **Less specialized/more generalized application of skills.**
- ☐ **No longer current in research field of PhD dissertation.**
- ☐ **Lack of job stability.**
- ☐ **Impersonal/detachment from work: commercial direction constantly changes or even halts.**
- ☐ **Requires learning a new area to pursue this career option.**

CAREER OPTIONS: TECHNOLOGY TRANSFER LICENSING ASSOCIATE

PROS

- ☐ **Constant learning: "Jack of all trades, master of none".**
- ☐ **Remain part of academic community**
- ☐ **Contribute directly to transferring new discoveries and innovations from bench to bedside to benefit society**
- ☐ **Working with people as a team to achieve a goal**
- ☐ **Bridging three worlds- science, law and business-to effectively communicate and achieve the goals**

CONS

- ☐ **Workload quite heavy and time management important.**
- ☐ **Face of university administration. Have to abid by university policy, even when don't agree with them.**
- ☐ **Low success rate for projects.**
- ☐ **Dealing with others' unrealistic expectations (both company and faculty).**
- ☐ **Limits to salary, location and advancement when working in a university office**

CAREER OPTIONS: RESEARCH POSITION AT THE VA

PROS

- ☐ **Extra funding avenue in addition to NIH.**
- ☐ **Research Career Scientist award provides 100% salary support (equivalent to tenure).**
- ☐ **Opportunity to work with physician scientists**
- ☐ **Research support services**
- ☐ **Government sponsored retirement program**

CONS

- ☐ **Administrative paperwork and regulations are burdensome.**
- ☐ **Financial management of grants can be difficult (no carry over from year to year)**
- ☐ **Grants have lower direct costs**
- ☐ **Need to work hard to stay integrate with the university.**
- ☐ **Doesn't have respect that some institutions have.**

CAREER OPTIONS: EMORY UNIVERSITY LECTURER

PROS

- ☐ Interacting with good colleagues and students.
- ☐ **No grant writing, but all the resources of an R1 university without a research group.**
- ☐ **Infrastructure for teaching at Emory is strong. There is time and support for educational innovation.**
- ☐ **Time is flexible – Lecture track faculty can contribute to college life on many fronts,**
  from committees, optional research projects, curricular reform
- ☐ **You can be a valued member of a department if the department sees teaching as a priority.**

CONS

- ☐ **There was pressure to pursue the "Most Noble Path" for a PhD - the one of**
  research, training graduate students, writing papers.
- ☐ **Some colleagues do not see the value of lecture track faculty. They see two levels of**
  faculty, with tenure-track being superior.
- ☐ **Guidelines for reappointment and promotion are not always clear. Resources do not always match expectations.**
- ☐ **Larger classes, less variety of courses taught, almost always first-and second-year level classes. Few opportunities to teach advanced classes.**
- ☐ **No true job security.**

Appendix 5. Listing of Neuroscience Faculty

9/19/2013

NAME (Last, First, MI)	**Email**	**Dept, Campus Address**	**Phone**	**Fax**
***Associate faculty**				
Alvarez, Francisco	francisco.j.alvarez@emory.edu	Physiology 642 Whitehead	727-7519	727-2648
Bachevaliler, Jocelyne	jbachev@emory.edu	Psychology/Yerkes Yerkes NS Bldg	727-9765	727-0372
Bassell, Gary	gary.bassell@emory.edu	Cell Biology #405K Whitehead Bldg	727-3772	727-6256
Bellamkonda, Ravi	bellamkonda@emory.edu	Biomedical Engineering 200 Health Sciences Bldg	727-9875	727-9873
Berns, Gregory	gberns@emory.edu	Economics 327 Rich Memorial Bldg	727-2556	727-3233
Betarbet, Ranjita	rbetarb@emory.edu	Neurology 05G Whitehead Bldg	727-9104	727-3728
***Bonsall,** Robert, W.	rbonsal@emory.edu	Psychiatry 504N Emory West	712-9853	712-9852
Boulis, Nicholas	nboulis@emory.edu	Neurosurgery 1365B Clifton Rd, #6200	778-5770	
Bowman, F. Dubois	dbowma3@emory.edu	Biostatistics, SPH 338 GC Rollins SPH	712-9643	727-1370
Bremner, Douglas	jdbremn@emory.edu	Director, PET Center Radiology, EUH	712-0108	712-7435
Buetefisch, Cathrin	cathrin.buetefisch@emory.edu	Neurology 1441 Clifton Rd. #236.	712-5507	712-5895
***Butler,** Andrew	ajbutle@emory.edu	Rehab Medicine 1441 Clifton Rd	712-5675	712-5895
Calabrese, Ronald, L.	biolrc@emory.edu	Biology 2113 Rollins	727-0319	727-2880
Caspary, Tamara	tcaspar@emory.edu	Human Genetics #305B Whitehead Bldg	727-9862	727-3949
Caudle, Mike	william.m.caudle@emory.edu	Environmental Health Claudia Nance Rollins	712-8432	727-8744
Chan, Anthony	awchan@emory.edu	Human Genetics Yerkes NS Bldg	712-8347	727-3949
Chen, Ping	pchen2@emory.edu	Cell Biology Whitehead Bldg, #545	727-1808	727-6256
Chin, Lih-Shen	chinl@pharm.emory.edu	Pharmacology 5019 Rollins	727-0361	727-0365
Choi, Inyeong	ichoi@emory.edu	Physiology 605E Whitehead Bldg	712-2092	727-2648
Cohen, Robert M.	robert.m.cohen@emory.edu	Psychiatry & Behavioral Sciences Wesley Woods Health Center	727-4376	
***Cubells,** Joseph	jcubells@emory.edu	Human Genetics 7305 WMB	727-2005	727-3949
Davis, Michael	mdavis4@emory.edu	Psychiatry 4311 WMRB	727-3591	727-3436
***DeWeerth,** Steve	steve.deweerth@gatech.edu	BME, GA Tech 315 Ferst Dr. Suite 1121	894-4738	894-4243
Dingledine, Raymond	rdingle@emory.edu	Pharmacology 5001A Rollins	727-5982	712-9920

English, Arthur, W.	medae@emory.edu	Cell Biology 405P Whitehead Bldg.	727-6250	727-3677
Escayg, Andrew	aescayg@emory.edu	Human Genetics 365 Whitehead Bldg	712-8328	727-3949
***Falls,** Douglas	dfalls@emory.edu	Biology 2129 Rollins	727-0520	727-2880
Faundez, Victor	faundez@cellbio.emory.edu	Cell Biology 446 Whitehead Bldg	727-3900	727-6256
Gambello, Michael	Michael.j.gambello@emory.edu	Human Genetics 301 Whitehead	727-3875	
Garraway, Sandra	smgarraway@emory.edu	Physiology 605R Whitehead	727-7417	727-2648
Glass, Jonathan	Jglas03@emory.edu	Neurology 505K Whitehead Bldg	727-3507	727-3728
Goodman, Mark	mgoodma@emory.edu	Radiology, EUH 1354 Clifton Rd NE	727-9366	712-5689
Gourley, Shannon	Shannon.I.Gourley@emory.edu	Pediatrics Yerkes Primate Center	727-2482	727-8070
Graham, Kareem	kareem.graham@emory.edu	Physiology 646 Whitehead	727-6478	727-2648
Gross, Robert	robert.cross@emory.edu	Neurosurgery Emory Clinic B, TEC B6209	778-5770	778-5121
Guo, Ying	yguo2@emory.edu	Biostatistics, SPH 366 GC Rollins, SPH	712-8646	727-1370
Hall, Randy, A.	rhall3@emory.edu	Pharmacology 5113 Rollins	727-3699	727-0365
Hartzell, Criss	criss@cellbio.emory.edu	Cell Biology 544 Whitehead Bldg	727-0444	727-6256
Hepler, John	jhepler@emory.edu	Pharmacology Biochemistry Connector, G205	727-3641	727-0365
***Herndon,** James, G.	jim@rmy.emory.edu	Neuroscience / Yerkes Yerkes NS Bldg	727-7752	727-7845
Hess, Ellen	ejhess@emory.edu	Pharmacology 5000 Rollins	727-4911	727-0365
Hochman, Shawn	shawn.hochman@emory.edu	Physiology 644 Whitehead Bldg.	712-3131	727-2648
Howell, Leonard	lhowell@emory.edu	Neuroscience / Yerkes Yerkes NS Bldg	727-7786	727-1266
Hu, Xiaoping	xhu @ bme.emory.edu	Biomedical Engineering 531 Asbury Circle, Annex #N305	712-2615	712-2707
***Humphrey,** Donald	donald.humphrey@emory.edu	Physiology 605M Whitehead Bldg.	727-7419	727-2648
Iuvone, Michael	miuvone@emory.edu	Pharmacology 5107 Rollins.	727-5989	727-0365
Jaeger, Dieter	djaeger@emory.edu	Biology 2129 Rollins	727-8139	727-2880
Jenkins, Andrew	ajenki2@emory.edu	Anesthesiology 5013.Rollins Research Ctr.	727-3910	712-2585
Jin, Peng	peng.jin@emory.edu	Human Genetics #325 Whitehead Bldg.	727-3729	727-3949
Jinnah, Hyder	hjinnah@emory.edu	Neurology 63000 WMRB	727-9107	712-8576
***Johnson**, Zach	zpjohns@emory.edu	Yerkes / Dev. & Cognitive NS Yerkes NS 5274	727-8518	727-8088
Joshi, Harish	medhcj@emory.edu	Cell Biology 447 Whitehead Bldg.	727-0445	727-6256

Jovanovic, Tanja	tjovano@emory.edu	Psychiatry 49 Jesse Hill Jr. Dr. Suite 331	778-1485	778-1488
Kahn, Rick	rkahn@emory.edu	Biochemistry G218 Rollins	727-3561	727-3746
***Keilholz,** Shella	skeilho@emory.edu	Biomedical Engineering 2009C WMB	727-2433	727-9873
***Kenney,** Anna	anna.kenney@emory.edu	Pediatrics HSRB E386 / 1760 Haygood Dr.	727-1836	
***Kinkead,** Becky	bkindea@emory.edu	Psychiatry 4109 WMB	727-3719	727-3233
Kuhar, Michael	mkuhar@rmy.emory.edu	Neuroscience / Yerkes Yerkes NS Bldg	727-3278	727-7845
Kukar, Thomas	thomas.kukar@emory.edu	Pharmacology 5123 Rollins	727-5983	727-0365
Lah, James, J	jlah@emory.edu	Neurology 505 Whitehead Bldg	727-3509	727-3728
***LaPlaca,** Michelle	michelle.laplaca@bme.gatech.edu	BME, GA Tech 315 Ferst Dr. Suite 1121	894-4738	894-4243
Lee, Robert	robert.lee@bme.gatech.edu	BME, GA Tech 315 Ferst Dr. Suite 1121	894-4738	894-4243
Levey, Allan	alevey@emory.edu	Neurology 6005 WMRB.	727-5006	727-3157
Li, Lian	lli5@emory.edu	Pharmacology 109 Rollins	727-5987	727-0365
Li, Xiao-Jiang	xiaoli@emory.edu	Human Genetics 347 Whitehead Bldg.	727-3290	727-3949
Lin, Erick X.	xlin2@emory.edu	Otolaryngology 615 Whitehead Bldg, #543	727-3723	727-6256
Liu, Robert	rliu2@emory.edu	Biology 2131 Rollins	727-5274	727-2880
Maney, Donna	dmaney@emory.edu	Psychology 205 Psychology	727-7470	727-0372
Manns, Joseph	jmanns@emory.edu	Psychology 208 Psychology	727-7459	727-0372
Mao, Zixu	zmao@emory.edu	Pharmacology 505G Whitehead	727-8581	727-0365
Mayberg, Helen	hmayber@emory.edu	Psychiatry 4000 WMB	727-6740	727-6743
McKeon, Robert	rmckeon@emory.edu	Cell Biology 405M Whitehead Bldg.	727-6956	727-6256
Miller, Andrew	amill02@emory.edu	Psychiatry 4103 WMRB	727-8260	727-3233
Miller, Gary	gwmille@emory.edu	Environmental & Occ. Heath Claudia Nance Rollins Bldg. #8007	712-8582	727-3728
Muly, Christopher	emuly@emory.edu	Psychiatry Yerkes NS Bldg	727-9603	727-3278
Neigh. Gretchen	gretchen.neigh@emory.edu	Physiology 5000 WMB	727-9022	727-3233
***Neill,** Darryl, B.	dneill@emory.edu	Psychology 328 Psychology Bldg.	727-7445	727-0372
Nemenman, Ilya	ilya.nemenman@emory.edu	Physics Math/Sciences Ctr-N240	727-9286	727-0873
Ousley, Opal	oousley@emory.edu	Psychiatry	727-8350	727-3969
Owens, Michael J.	mowens@emory.edu	Psychiatry 4005 WMRB	727-4059	727-3233

Papa, Stella	spapa@emory.edu	Neurology / Yerkes Yerkes NS Bldg	727-7795	727-3278
Pardue, Michelle	mpardue@emory.edu	Ophthalmology/BME Emory Clinic/ GA Tech	404-321-6111	
Parr, Lisa	lparr@emory.edu	Neuroscience / Yerkes Yerkes NS Bldg	727-3653	
Pearce, Brad	bpearce@emory.edu	Psychology	727-4914	727-3233
Perreault, Marie-Claude	m-c.perreault@emory.edu	Physiology 647 Whitehead	727-9897	727-2648
***Plotsky**, Paul	pplotsky@emory.edu	Psychiatry	712-9835	727-3233
****Potter,** Steve	steve.potter@bme.gatech.edu	BME GA Tech 315 Ferst Dr. #1121	385-2989	894-4243
Preuss, Todd	tpreuss@emory.edu	Neuroscience / Yerkes Yerkes NS Bldg	727-8556	727-8070
Prinz, Astrid	Astrid.prinz@emory.edu	Biology 2105 Rollins RC	727-5191	727-2880
Raastad, Morten	morten.raastad@emory.edu	Physiology 605F Whitehead	727-7425	727-2648
Rainnie, Donald	drainni@emory.edu	Psychiatry 4309 WMRB	712-9714	727-3233
Read, Tracy-Ann	taread@emory.edu	Neurosurgery 1365C Winship Cancer Institute	778-4024	778-5550
Ressler, Kerry	kressle@emory.edu	Dept. of Psychiatry 1022 Yerkes Primate Ctr.	727-7739	727-8070
Rilling, James	jrillin@emory.edu	Anthropology Geosciences 114	727-5881	727-3233
***Rodman,** Hillary	hrodman@emory.edu	Psychology	727-2391	727-0372
Rossoll, Wilfried	wrossol@emory.edu	381 Psychology Bldg.		
Rye, David, B.	drye@emory.edu	Neurology 6000 WMRB	727-9825	727-3157
Sanchez. Mar	mmsanch@emory.edu	Psychiatry 4000 WMRB	712-2393	727-3233
Sathian, Krish	ksathia@emory.edu	Neurology 6301 WMRB	727-1324	727-8576
Smith, Patrice	patrice.smith@emory.edu	Physiology, CND 575 Whitehead	727-0633	727-2648
Smith, Yoland	ysmit01@emory.edu	Neuroscience / Yerkes 353 Yerkes	727-7519	727-3278
Sober, Samuel J	samuel.j.sober@emory.edu	Biology 2103 Rollins	727-5846	727-2880
***Sokoloff,** Alan	asokolo@emory.edu	Physiology 605H Whitehead Bldg.	727-9905	727-2648
Srinivasan, Shanthi	ssrini2@emory.edu	Digestive Diseases 201 Whitehead Bldg.	727-5298	727-5767
Stein, Donald	dstein04@emory.edu	Emergency Med/Psychology 261 A/P Connector.	712-2540	712-9704
Tansey, Malu	malu.tansey@emory.edu	Physiology 645 Whitehead	727-6126	727-2648
Ting, Lena H.	lting@emory.edu	BME, GA Tech 315 Ferst Dr., #3306	894-5216	894-4243
Traynelis, Stephen	strayne@emory.edu	Pharmacology 5025 Rollins	727-0357	727-0365

Trumbower,Randy	randy.trumbower@emory.edu	School of Rehab. 1441, Clifton Rd-G36	727-3065	
Van Meir, Erwin	evanmei@emory.edu	Neurosurgery C5078 Winship Cancer Institute	778-5563	778-5550
Walker, David L	dlwalke@emory.edu	Psychiatry Whitehead 4306	727-3587	727-8070
Walker, Elaine	psyefw@emory.edu	Psychology 303 Psychology	727-0761	727-0372
Walker, Lary	lcwalke@emory.edu	Neuroscience / Yerkes Yerkes NS Bldg	727-7779	727-1266
Warren, Stephen	swarren@emory.edu	Human Genetics 305E Whitehead Bldg	727-5979	727-3949
Wei, Ling	lwei7@emory.edu	Anesthesiology 1462 Clifton Rd. #240	778-3900	
Weinshenker, David	dweinsh@emory.edu	Human Genetics 301 Whitehead Bldg.	727-3106	727-3949
Weiss, Jay, M.	jweis01@emory.edu	Psychiatry 510N Emory West	712-9772	712-9755
Wenner, Peter	pwenner@emory.edu	Physiology 645 Whitehead Bldg.	727-1517	727-2648
Wichmann, Thomas	twichma@emory.edu	Neurology 6109 WMRB	727-7795	727-9294
Wilson, Mark, E.	mwils02@emory.edu	Neuroscience, Yerkes 1024 Yerkes Primate Ctr	727-9058	727-8088
Wolf, Steven, L.	swolf@emory.edu	Rehab Medicine 212C Rehab Center	712-4801	712-4809
***Wright,** David	dwwrigh@emory.edu	Emergency Med. 1712 Uppergate Dr, #36	712- 0511	712-9706
Young, Larry	lyoun03@emory.edu	Psychiatry, Yerkes 1028 Yerkes	727-8272	727-8070
Yu, Shan Ping	spyu@emory.edu	Anesthesiology 1462 Clifton Rd. #240	778-3900	
Zheng, James	james.zheng@emory.edu	Cell Biology 546 Whitehead	727-9133	727-6256
***Zola,** Stuart	szola@emory.edu	Director, Yerkes Primate Ctr 1123 Yerkes	727-7707	727-0623

Appendix 6. Listing of Neuroscience Program Committees and Members

Executive Committee:

FACULTY MEMBERS

Shawn Hochman	Program Director Physiology
Victor Faundez,	DGS, Years 1-2, Cell Biology
Malu Tansey,	DGS, Years 3+, Physiology
Francisco Alvarez	Physiology
Ronald Calabrese	Biology
Jocelyne Bachevalier	Psychology
Gary Bassell	Cell Biology
Art English	Cell Biology
Andrew Escayg	Human Genetics
Shannon Gourley	Yerkes
Ellen Hess	Pharmacology
Dieter Jaeger	Biology
Andrew Jenkins	Anesthesiology
Shella Keilholz	Biomedical Engineering
Robert Liu	Biology
Donna Maney	Psychology
Gretchen Neigh	Physiology
Machelle Pardue	Ophthalmology/Emory Eye Center
Lisa Parr	Yerkes
Mar Sanchez	Psychiatry & Behavioral Sciences
Sam Sober	Biology
Lary Walker	Neurology
David Weinshenker	Human Genetics
Thomas Wichmann	Neurology

Student Members
Natty Chalermpalanupap
Jodi Godfrey

Admissions Committee: Ellen Hess, Director
Gary Bassell, Ranjita Betarbet, Ron Calabrese, Joe Cubells, Donna Maney, Don Rainnie, Yoland Smith, Lary Walker, Kim Lang, Kevin Watkins, Gary Longstreet

Seminar Directors: NS Professional Development: Shawn Hochman, Machelle Pardue, Robert Liu, Francisco Alvarez
Advanced Seminar: Andrew Escayg and Gretchen Neigh

Frontiers Seminar Coordinators: Shawn Hochman, Travis Rotterman, and Michael McKinnon

Awards Committee: Andrew Jenkins (Chair), Sara Freeman, and Jordan Kohn

Website Committee: Mar Sanchez (Chair), Gary Longstreet, Lukas Hoffman

Appendix 7. Listing of Neuroscience Program Students

Graduate Program in Neuroscience – Students *name underscored denotes MD/PhD Student*

2013

Name	E-mail	Phone #	Rotation Advisor	Lab Phone
Elizabeth Barfield	elizabeth.t.barfield@gmail.com	864-506-1424		
Mandakh Bekhbat	mandakh.bekhbat@emory.edu	845-664-0982		
Maria Briscione	mariabriscione@gmail.com			
Laura Butkovich	laura.butkovich@gmail.com	404-217-4750		
Rachel Cliburn	racliburn@gmail.com	224-433-1180		
Julianne Freeman	julianne.j.freeman@gmail.com			
Dora Guzman	dorabguzman@gmail.com	404-840-0713		
Chia Chun (Jeffrey) Hsu	hurdleman@gmail.com			
Elizabeth Kline	kline.elizabethm@gmail.com			
Erica Landis	erica.grace.landis@emory.edu	651-295-7687		
Chao Lin	chao.lin0076@gmail.com	315-396-9096		
Claire McGregor	clairekmcgregor@gmail.com			
Olivia Moody	omoody89@gmail.com			
Arthur Morrissette	arthur.morrissette@gmail.com	703-593-0826		
Brendan O'Flaherty	oflaherty.brendan@gmail.com	630-729-4577		
Phillip Price	plprice@emory.edu			
Varun Saravanan	zbpvarun@gmail.com	678-643-3320		
Kun Tian	ktmelody@gmail.com	217-898-9272		
Mfon Umoh	mumoh@emory.edu		Jonathan Glass	
James Zhang	james.zhang@emory.edu		Ling Wei	

2012

Name	E-mail	Phone #	Rotation Advisor	Lab Phone
Yan Hong	yhong31@emory.edu	334-707-9171	Xiao-Jiang Li	
Michael Jiang	qjiang7@emory.edu		Ling Wei	
Eric Maltbie	ericmaltbie@gmail.com	919-949-3816	Leonard Howell	
Kenneth McCullough	kenneth.mccullough@emory.edu	404-933-3515	Kerry Ressler	
Michael McKinnon	michael.l.mckinnon@emory.edu	404-275-1398	Shawn Hochman	
Amielle Moreno	amielle.moreno@gmail.com	206-669-3320		
Maylen Perez Diaz	maylen21488@yahoo.com		Leonard Howell/Mark Wilson	
Elizabeth Pitts	liz.g.pitts@gmail.com		Leonard Howell	
Brian Prall	bprall@emory.edu	703-999-5112		
Travis Rotterman	travis.m.rotterman@emory.edu	937-903-1144	Francisco Alvarez	
Ashley J. Sullivan	ajsulli@emory.edu	215-901-7106	Yoland Smith	

2011

Name	E-mail	Phone #	Rotation Advisor	Lab Phone
Jacob Billings	billings.jacob@gmail.com	850-264-4687	Shella Keilholz	
Ching-Chieh (Ian) Chou	numen1104.chou@gmail.com	404-281-8178	Wilfried Rossoll/Gary Bassell	
Daniel Curry	benno.dc@gmail.com	615-500-6395	Leonard Howell	
Lauren DeBrouse	ldebrou@emory.edu	443-995-3484	Shannon Gourley	
Jodi Godfrey	jrgodfr@emory.edu	770-402-7532	Mark Wilson/Mar Sanchez	
Constance Harrell	csharrell@gmail.com	404-805-0817	Gretchen Neigh	
Orion Keifer	orionkeifer@gmail.com	404-717-7969	Kerry Ressler	
Kara Kittelberger	kittelberger.k@gmail.com	585-319-9586	Larry Young	
Jordan Kohn	Jordan.n.kohn@emory.edu		Mark Wilson	
Kim Lang	kim.lang.09@gmail.com	908-415-3780		
Evan Lebois	evan.p.lebois@emory.edu	410-251-0868	Allan Levey/Joe Manns	7-7459

Amy Luce	amy.luce@emory.edu	207-431-4295	Gary Miller
Kathryn Martin	kpmart2@emory.edu	812-322-6165	Malu Tansey
Filomene Morrison	fgmorri@emory.edu	510-282-1502	Kerry Ressler
Melanie Pincus	mpincus@gmail.com	201-452-8427	Greg Berns
Ryan Purcell	ryan.purcell@emory.edu	443-603-3867	Randy Hall
Nisha Raj	nisharaj88@gmail.com	678-462-5156	Gary Bassell
Kristen Thomas	ktthoma@emory.edu		Gary Bassell
Kevin Watkins	kevinewatkins@gmail.com	404-624-6866	Shawn Hochman
Ting Zhao	tzhao5@emory.edu		Xiao-Jiang Li

2010

Name	E-mail	Phone #	Rotation Advisor	Lab Phone
Natty Chalermpalanupap	nattycpalanupap@yahoo.com	404-547-1699	David Weinshenker	
Paul Evans	pevansj@learnlink.emory.edu	678- 986-8459	John Hepler	
Michelle Giddens	michelle.giddens@emory.edu	6176105154	Randy Hall	
Thomas Hennessey	tom.hennessey@gmail.com	734-545-0937	Don Rainnie	
Lukas Hoffman	Lukas.hoffmann@emory.edu	716-907-6065	Sam Sober	2-6645
Laura Jones	ljones312@gmail.com	404-754-0806	Art English	
Tyra Lamar	tlamar@learnlink.emory.edu	678-637-5196	Gary Bassell	
Kelly Lohr	klohr@emory.edu	724-493-2401	Gary Miller	
David Nicholson	nicholdav@gmail.com	813-233-6553	Sam Sober	2-6645
Samuel Rose	samueljosephrose@gmail.com	770-842-3767	Ellen Hess	
Kristen Sanders	Kristen.sanders@emory.edu	315-794-9451	Nick Boulis	
Karl Schmidt	karl.t.schmidt@gmail.com	336-392-7626	David Weinshenker	
Iris Spiegel	iris.speigel@gmail.com	404-593-3250	Shawn Hochman	
Andrew Swanson	andrew.swanson@emory.edu	404-414-6871	Shannon Gourley	
Bethany Wilson	bkwils@gmail.com	404-946-3876	Ellen Hess	
Kelsey Zimmerman	kszimme@learnlink.emory.edu	512-332-1642	Ressler & Gourley	7-8755

2009

Name	E-mail	Phone #	Thesis Advisor	Lab
Mallory Bowers	mallorybowers@gmail.com	215-850-3411	Kerry Ressler	7-7997
Katherine Bryant	katherinelbryant@gmail.com	404-333-3555	Todd Preuss	7-1331
James Burkett	jamespburkett@gmail.com	678-438-6319	Young/DeWaal	7-8269
Amarallys Cintron	afcintr@emory.edu	407-758-3516	Larry Walker	
Todd Deveau	tdeveau@emory.edu	404-226-3228	Ling Wei	
Sarah DeWitt	sarah.dewitt5@gmail.com	404-786-0977	Don Rainnie	7-3981
Zack Johnson	zjohnso2@gmail.com	815-218-1126	Larry Young	
Joe Mertz	jmertz@emory.edu	607-351-4706	Junmin Peng	
Ariana Mullin	ariana.mullin@gmail.com	203-687-6255	Victor Faundez	7-5617
Donald Noble	djnoble@emory.edu	760-214-4048	Shawn Hochman	
Cecilia Prudente	cecilianasciprud@gmail.com	404-447-9006	Buzz Jinnah	7-1678
Kathy Reding	katherine.reding@gmail.com	202-577-1029	Mark Wilson	722-9420
Drew Solyst	DrewSolyst@gmail.com	410-9198599	Beth Buffalo	2-9435

2008

Name	E-mail	Phone#	Thesis Advisor	Lab
Phone				
Harry Aung	kyawhein@gmail.com	404-354-3108	Machelle Pardue	
Catherine (Katie) Barrett	cbarrett27@gmail.com	404-784-5886	Larry Young	7-8269
David Bass	dibass@emory.edu	904-465-6561	Joe Manns	
Monica Chau	mjchau07@gmail.com	510-415-9773	Ling Wei	2-7332
Ming-fai Fong	ming-fai.fong@emory.edu	404-556-0293	Pete Wenner/Steve Potter	7-1518
Lanikea King	lking7@emory.edu	808-782-9539	Larry Young	7-2101

Laura Mariani	lmariani@gmail.com	727-692-9879	Tamara Caspary	7-3581
Abraham Mathai	amatha2@emory.edu	862-307-5189	Yoland Smith	7-5896
Callie McGrath	callie.mcgrath@gmail.com	508-284-4585	Helen Mayberg	
Karen Murray	kmurra5@emory.edu	703-283-0110	Mike Owens	7-6120
Leila Myrick	lkhooga@emory.edu	678-602-6119	Steve Warren	7-0406
Christina Nemeth	christinanemeth@gmail.com	315-778-7763	Gretchen Neigh	7-9022
Yvonne Ogbonmwan	yogbonm@emory.edu	770-906-5433	David Weinshenker	2-8266
Kathryn (Katy) Shepard	katy.shepard@gmail.com	678-488-7052	Robert Liu	7-9207

2007

Name	E-mail	Phone #	Thesis Advisor	Lab
David Ehrlich	dehrli2@emory.edu	215-570-4087	Don Rainnie	7-3981
Sara Freeman	smfreem@emory.edu	770-314-0609	Larry Young	7-8269
Lucy Guillory	lcguill@emory.edu	770-377-6588	Nemeroff/Kinkead	7-6120
Chris Makinson	cmakins@emory.edu	336-202-9612	Andrew Escayg	2-2152
Jeanne McKeon	jmckeon@emory.edu	860-202-8435	Lian Li	7-5617
Rebecca Meyer	rcmeyer@emory.edu	402-239-1571	Randy Hall	7-3751
Steven Ryan	sryan2@emory.edu	404-394-7661	Don Rainnie	7-3981
Nikki Sawyer	nsawye2@emory.edu	404-917-5268	Andrew Escayg	2-2152
Rachael Stewart	restewa@emory.edu	770-876-0374	Donald Stein	

2006

Name	E-mail	Phone #	Thesis Advisor	Lab
Amanda Caster	acaster@emory.edu	404-486-0092	Rick Kahn	7-3562
Kalynda Gonzales	kkgonza@emory.edu	617-319-9441	Smith/Wichmann	7-5896
Brittany Howell	bcopp@emory.edu	404-431-7750	Mar Sanchez	7-7728

2005

Name	E-mail	Phone #	Thesis Advisor	Lab
Teresa Madsen	tmadsen@emory.edu	770-296-9119	Don Rainnie	7-3981
Ahmad Sylvester	asylves@emory.edu	716-946-3907	Allan Levey	7-8043

****

Appendix 8. Core Course Syllabi

IBS 526 NEUROANATOMY AND SYSTEMS NEUROSCIENCE

DATE-ROOM	LECTURE	LECTURERS	PAPER DISCUSSION-REVIEWS
	GROSS ANATOMY OF THE CNS	**Y. SMITH**	
Wed/Aug 28 YNS	Cellular Organization of the CNS	Smith	Chapter 4
Th/ Aug 29 YNS	Gross Organization of the Mammalian Nervous System I	Smith	Chapters1,2,15
Fr/Aug 30 Bourne	Gross Organization of the Mammalian Nervous System II	Smith	Chapters1,2,15
Mo/Sept 02	LABOR DAY		
Tu/Sept 03 (SOM-B37)	Lab #1-Gross Anatomy Human Brain	Smith, Preuss, Walker TAs	Lab manual
Wed/Sept 04 (SOM-B37)	Lab #2-Human Brain Dissection	Smith, Preuss, Walker TAs	Lab manual
Th/Sept 05 (SOM-B37)	Lab #3-Comparative Neuroanatomy	Smith and TAs	Lab manual
Fr/Sept 06 (SOM-B37)	Lab #4-Review	Smith and TAs	Lab Manual
	EXPERIMENTAL NEUROANATOMY	**Y. SMITH**	
Mo/Sept 09 YNS	Exptl Neuroanatomy-Tract-Tracing Methods/Immunocytochemistry	Smith	Instr handouts
	BRAIN EVOLUTION AND ORGANIZATION OF THE CEREBRAL CORTEX	**Y. SMITH**	
Tu/Sept 10 YNS	Brain evolution-Primates vs non-primates	Preuss	Instr handouts
We/Sept 11 YNS	Regional and Connectional Organization of the Cerebral Cortex	Preuss	Chapter 15
Th/Sept 12 YNS	Internal organization of the cerebral cortex	Muly	Chapter 15
	ELECTROPHYSIOLOGY AND BRAIN IMAGING		
Fr/Sept 13 Bourne	In vivo electrophysiology and Optogenetics	Wichmann/Galvan	Instr handouts
Mo/Sept 16 YNS 8:15-9:15	**REVIEW SESSION**	**TAs**	
Mo/Sept 16 YNS	Brain Imaging Techniques-MRI, fMRI, PET	Keilholz	Instr handouts
Tu/Sept 17 YNS	**EXAM #1**		
	note that a session outside regular class hours will be scheduled for paper discussion and experimental neuroanatomy lab.		
	SENSORY SYSTEMS	**K. SATHIAN**	
We/Sept 18 YNS	Somatosensory anatomy	K. Sathian	Chapters 21,22
Th/Sept 19 YNS	Physiology of Touch	K. Sathian	Chapters 21,23
Fr/Sept 20 YNS	Vision I-Retina	M. Pardue	Chapters 26,27
Mo/Sept 23 YNS	Vision II-Cortex and related subcortical structures	R. Liu	Chapters 26,27
Tu/Sept 24 YNS	Olfaction & Taste	K. Ressler	Chapter 32
We/Sept 25	Hearing	Polensek	Chapters 30,31

Bourne			
Th/Sept 26 YNS	Vestibular System	Polensek	Chapter 40
Fr/Sept 27 YNS	Plasticity of Sensory Systems	K. Sathian	Instr handouts
Mo/Sept 30 YNS	Pain	S. Hochman	Chapter 24
Tu/Oct 01 YNS 8:15-9:15	**REVIEW SESSION**	**TAs**	
Tu/Oct 01 YNS	Proprioception	S. Hochman	Chapter 22
We/Oct 02 YNS	**EXAM #2**		
	MOTOR SYSTEMS	**S. HOCHMAN**	
Th/Oct 03 YNS	Motor Systems Overview	S. Hochman	Chapter 33,34
Fr/Oct 04 YNS	Paper Discussion-Sensory Systems	K. Sathian et al	
Mo/Oct 07 Bourne	Functional Anatomy of the Spinal Cord	P. Alvarez	Instr. handouts
Tu/Oct 08 YNS	Central Pattern Generators	S. Hochman	Chapter 35,36
We/Oct 09 YNS	Functional Anatomy of Subcortical Descending Systems	M.-C Perreault	Chapter 36
Th/Oct 10 YNS	Functional Anatomy of the Cerebellum	M. Raastad	Chapter 42
Fr/Oct 11 YNS	Functional Anatomy of Motor Cortices	C. Buetefisch	Chapter 37,38
Mo/Oct 14 YNS	Functional Anatomy of the Basal Ganglia	A. Galvan	Chapter 43
Tu/Oct 15 YNS	Solutions for movements in multidimensional space	R. Nichols	Instr. handouts
We/Oct 16 YNS	Motor Synergies in Balance and Locomotion	L.Ting	Chapter 41
Th/Oct 17 YNS	Movement Disorders	T. Wichmann	Instr. handouts
Fr/Oct 18 YNS	Reach and Grasp	S. Sober	Instr. handouts
Mo/Oct 21 YNS 8:15-9:15	**REVIEW SESSION**	**TAs**	
Mo/Oct 21 YNS	Motor Learning	S. Sober	Instr. handouts
Tu/Oct 22 YNS	**EXAM #3**		
	INTERNAL REGULATION	**L. YOUNG**	
We/Oct 23 YNS	Enteric Nervous System	S. Srinivasan	Chapter 47
Th/Oct 24 YNS	Psychoneuroimmunology	J. Felger	Instr handouts
Fr/Oct 25 YNS	Anatomy of hypothalamus and pituitary	L. Young	Martin's textbook (Chapter 14) Chapter 47
Mo/Oct 28 YNS	Paper Discussion-Motor System	M. Raastad	
Tu/Oct 29 YNS	Stress axis	M. Sanchez	Instr handouts
We/Oct 30	Regulation of Reproduction	M. Wilson	Chapter 51

YNS			
Th/Oct 31 YNS	Regulation of Food Intake	M. Wilson	Chapter 49
Fr/Nov 01 YNS	Role of Brain Peptides and Social Behavior	L. Young	Nature NS 7: 1048 Front. Neuroendocrin. 30 534–547
Mo/Nov 04 Bourne	Sleep and Arousal	A. Freeman	Chapters 46,51
Tu/Nov 05 YNS	Circadian rhythms	M. Iuvone	Nature rev NS 2003, 4:649
We/Nov 06 **YNS 8:15-9:15**	**REVIEW SESSION**	**TAs**	
We/Nov 06 YNS	Autonomic Nervous System	H. Yuan	Chapter 47
Th/Nov 07 **YNS**	**EXAM #4**		
	BEHAVIOR AND COGNITIVE NEUROSCIENCE	**J. BACHEVALIER**	
Fr/Nov 08 YNS	Anatomy of the hippocampus and related subcortical memory systems	Y. Smith	Chapter 65
Mo/Nov 11	SFN meeting/No Class		
Tu/Nov 12	SFN meeting/No Class		
We/Nov 13	SFN meeting/No Class		
Th/Nov 14 YNS	Learning and Memory Systems	J. Manns	Chapters 65,66,67
Fr/Nov 15 YNS	The Hippocampal Formation – Memory, Space, and Time	J. Manns	Chapters 65,66,67
Mo/Nov 18 YNS	Paper Discussion-Internal Regulation	L. Young et al	
Tu/Nov 19 YNS	Memory Consolidation/Reconsolidation	D. Walker	Chapter 48
We/Nov 20 YNS	Brain Systems Involved in Stress and Anxiety	S. Gourley	Chapter 63
Th/Nov 21 YNS	Brain Systems Involved in Fear	K. Ressler	Chapter 48
Fr/Nov 22 YNS	Prefrontal Cortex in Working Memory	C. Muly	Chapter 67
Mo/Nov 25	Developing Brain and Mind	J. Bachevalier	
Tu/Nov 26 YNS	Social Cognition	J. Rilling	
We/Nov 27	Thanksgiving Holiday		
Th/Nov 28	Thanksgiving Holiday		
Fr/Nov 29	Thanksgiving Holiday		
Mo/Dec 02 YNS	Paper critique/Discussion-Behav. Cognitive NS	Module leader et al.	Manuscript from instructor
Tu/Dec 03 YNS	Reward Systems in the Brain	D. Neill	Chapter 49
We/Dec 04 YNS	Cognition in Aging	J. Bachevalier	Chapter 59
Th/Dec 05 YNS	Decision-Making and Neuroeconomics	Greg Berns	
Fr/Dec 06 **YNS 8:15-9:15**	**REVIEW SESSION**	**TA**	
Fr/Dec 06 YNS	Language and Aphasia	B. Crosson	
Mo/Dec 09 **YNS**	**EXAM #5**		

IBS 514: CELLULAR, MOLECULAR, AND DEVELOPMENTAL NEUROSCIENCE

Class meets M-F 9:00-10:30 Room 123 Dental School
(1462 Clifton Building)

	IBS 514-CELLULAR, MOLECULAR, DEVELOPMENTAL NEUROSCIENCE (COURSE DIRECTOR: RONALD L. CALABRESE)	
	SPRING 2012	
DATE	**LECTURES**	**Faculty**
	MODULE 1 BASIC CONCEPTS: BIOCHEMISTRY, CELLULAR AND MOLECULAR BIOLOGY (Module Leader: John Hepler)	
Mo, Jan 14	Course Overview	Ron Calabrese (Director) and all six Module coordinators
Tu, Jan 15	**Intro: Building blocks of the cell** (DNA, RNA, Amino acids, proteins, Central dogma, lipids, membranes and organelles, cell structure and organization)	John Hepler
We, Jan 16	**Genes- DNA** (Gene structure, basic principles of gene transcription, regulation of gene transcription, intro to signaling, Mendelian genetics vs epigenetics)	Xi Erick Lin
Th, Jan 17	**RNA** (mRNA processing, ribosomes and protein translation (tRNA), Transport of mRNA and local protein synthesis, microRNA and siRNA control of gene expression; emerging importance of non-coding RNAs)	Peng Jin
Fr, Jan 18	**Proteins and CNS specific proteins** (Proteins are the worker bees of the cell; Primary, secondary and tertiary structure of proteins and why that matters; Housekeeping proteins, CNS specific genes/proteins, Signaling proteins: receptors, scaffolds, enzymes and channels)	Nick Seyfried
Mo, Jan 20	**MLK Holiday**	
Tu, Jan 22	**The importance of space, time and subcellular localization of proteins in neuronal cell function** (posttranslational modifications, protein domains and complexes-lipid interactions (e.g.	John Helper

	phosphoinositides); cell polarization and compartmentalization in CNS function; transport of mRNA and proteins (e.g. to dendrites, spines)	
We, Jan 23	**Paper Discussion #1**	
Th, Jan 24	**Cell Biology of Neurons and Glia** -Origins of Neuron doctrine -neuronal morphology and synapse structure -neuronal cytoskeleton	Gary Bassell
Fr, Jan 25	**Directed transport in neurons** -kinesin and dynein motors -cargo sorting into axons and dendrites	Gary Basell
Mo, Jan 28	**Introduction to neuronal signaling: The importance of space, time and subcellular localization of proteins in neuronal cell function.** Assembly of cell signaling complexes; posttranslational modifications, protein domains and complexes-lipid interactions (e.g. phosphoinositides); Cellular GTPases	John Hepler
Tu, Jan 29	**Paper Discussion**	TBD
We, Jan 30	**REVIEW SESSION- Take Home Exam**	Module 1 faculty
	MODULE 2 **CELLULAR AND MOLECULAR BIOLOGY OF NEURONS AND GLIA** **(Module Leaders: Victor Faundez/ James Zheng/ Tamara Caspary)**	
Th, Jan 31	Endoplasmic reticulum and Golgi Foundations	V. Faundez
Fr, Feb 01	Endocytic Mechanisms.	V. Faundez
Mo, Feb 04	Synaptic vesicle Biogenesis	V. Faundez
Tu, Feb 05	Neuro-Genetic Diseases of the Endolysosome Route	V. Faundez
We Feb 06	Ubiquitin dependent sorting and Neurodegeneration	Lih-Shen Chin
Th, Feb 07	**Paper Discussion #4**	**TO BE DETERMINED**
Fr, Feb 08	Autophagy and Neurodegeneration	Lih-Shen Chin
Mo, Feb 11	SNARES and synaptic vesicle fusion	Lian Li
Tu, Feb 12	Development and Maintenance of Cell Polarity in Neurons	J. Zheng
We, Feb 13	Cell Biology of Postsynaptic Plasticity	J. Zheng
Th, Feb 14	**Paper Discussion #5**	**TO BE DETERMINED**
Fr, Feb 15	Ribonucleoprotein Transport in Neuronal Systems	G. Bassell
Mo, Feb 18	Dynein Based Transport in Neuronal Systems	G. Bassell
Tu, Feb 19	Cilia Biology and signaling in Neuroepithelial cells	Tamara Caspary
	MODULE 3 **CELLULAR ELECTROPHYSIOLOGY** **(Module Leaders: Ron Calabrese/Dieter Jaeger/**	

	Criss Hartzell)	
We, Feb 20	Electronics for neuroscientists	R. Calabrese
Th, Feb 21	Resting Potential	R. Calabrese
Fr, Feb 22	Action potentials	R. Calabrese
Mo, Feb 25	Studying voltage gated channels I	R. Calabrese
Tu, Feb 26	Studying voltage gated channels II	R. Calabrese
We, Feb 27	Synaptic Transmission: Presynaptic mechanisms	C. Hartzell
Th, Feb 28	Synaptic Transmission: Postsynaptic Mechanisms I	C. Hartzell
Fr, March 01	Synaptic Transmission: Postsynaptic Mechanisms II	C. Hartzell
Mo, March 04	Ion channel diseases	C. Hartzell
Fr, Feb 10	**Paper Discussion and Essay #2**	**C. Hartzell**
Tu, March 05	Postsynaptic signal integration from an electrical perspective: All about EPSPs and IPSPs. KSJ Chs. 11-12).	D. Jaeger
We, March 06	Synaptic integration in vivo.- assigned papers.	D. Jaeger
Th, March 07	Short-term plasticity and variance-mean analysis – assigned papers.	D. Jaeger
Fr, March 08	**Paper Discussion and Essay #3**	**D. Jaeger**
	MODULE 4 SYNAPTIC TRANSMISSION AND SIGNAL TRANSDUCTION (Module Leader: Randy Hall)	
Mo, March 11	**SPRING BREAK**	
Tu, March 12	**SPRING BREAK**	
We, March 13	**SPRING BREAK**	
Th, March 14	**SPRING BREAK**	
Fr, March 15	**SPRING BREAK**	
Mo, March 18	Neurotransmitters	R. Hall
Tu, March 19	Neurotransmitter Receptor Signaling Pathways	R. Hall
We, March 20	Synaptic Plasticity I	S. Hochman
Th, March 21	Synaptic Plasticity II	S. Hochman
Fr, March 22	**Paper Discussion #6**	**S. Hochman**
Mo, March 25	Molecular Mechanisms of Synaptic Plasticity	R. Hall
Tu, March 26	Molecular Mechanisms of Axonal Pathfinding	J. Zheng
We, March 27	Steroid Signaling in the Nervous System	G. Neigh
Th, March 28	**Paper Discussion #7**	**G. Neigh**
Fr, March 29	Neurotrophins & Growth Factor Signaling	K. Ye
Mo, Apr 01	Neuroinflammatory & Apoptotic Signaling	M. Tansey
Tu, Apr 02	Sensory Signaling	R. Hall
	MODULE #5 BRAIN DEVELOPMENT (Module Leader: S. Sanyal)	

We, Apr 03	Tissue generation and cell-type specification in CNS	TA. Reid
Th, Apr 04	Neurogenesis and Migration	TA. Reid
Fr, Apr 05	Determination and Differentiation	S. Sanyal
Mo, Apr 08	Developmental principles of circuit formation	S. Sanyal
	MODULE #6 TRANSLATIONAL NEUROSCIENCE (Module Leaders: D. Weinshenker/L. Walker)	
Tu, Apr 09	PTSD	K. Ressler
We, Apr 10	Hypersomnia	A. Jenkins
Th, Apr 11	Ciliopathies/brain cancer	T. Caspary
Fr, Apr 12	Retinal disease	M. Pardue
Mo, Apr 15	Drug discovery)	H. Shlevin
Tu, Apr 16	Parkinson's Disease	M. Tansey
We, Apr 17	Epilepsy	A. Escayg
Th, Apr 18	Drug addiction	D. Weinshenker
Fr, Apr 19	Alzheimer's disease	L. Walker
Mo, Apr 22	Autism	L. Young
Tu, Apr 23	Fragile X	S. Warren
We, Apr 24	ALS	J. Glass
Th, Apr 25	Dystonia	E. Hess
Fr, Apr 26	Open	
Mo, Apr 29	Last Exam starts during class time	

Course Director:
Ron (Ronald L.) Calabrese (ronald.calabrese@emory.edu) will administer the entire course and is responsible for all Exams and Grading.

Blackboard:
The course will use Blackboard (https://classes.emory.edu/) for all communication and assignments. All lecture PowerPoint slides will be posted in advance on the course Blackboard site under a module # button. All registered students will be automatically enrolled on the Blackboard site. If you do not have access by January 8, please inform Ron Calabrese, course director.

Readings:
Textbook reading assignments will be posted 2-3 days before the corresponding lecture as announcements on the course Blackboard Site.
All papers for discussion will be posted as pdf files on the course Blackboard site 1 week in advance under a module # button.

Exams and Grades

After each module there will be an Exam - the module 5 and 6 Exams will be combined.

Each Module will be assigned 200 points for a total of 1,000 for the entire course. Each Module will post how these points are to be allocated between Exams and Essays/Paper Discussions as an Announcement on Blackboard.
Exams are scheduled during the evening at the end of each module except for modules 5 and 6. Evening exams will be arranged with the students. Module 5 and 6 share exam starting during the class period on April 29 (9-noon). Exams will be graded by the module faculty.
Essays/Paper Discussions will be graded as described for each module by the module faculty. See Module leader if you have questions or if Module expectations are not posted on Blackboard.

CREDIT:
Currently IBS 514 is assigned 4 credit hours. To obtain full credit for the course, you must enroll simultaneously in NS 797R (2771 OPUS) for 3 credit hours.
Variable credit (4-7 hours) can be arranged for BME students who do not wish to take all modules. Please see Ron Calabrese.

REQUIRED TEXTBOOKS

-Kandel, Schwartz, Jessel (2000) Principles of Neural Science, 4th Edition. McGraw Hill: New York.
-Lodish et al (2007) Molecular Cell Biology, 6th Edition.

MODULE CONTACTS:

Module 1: John Hepler	jhepler@emory.edu
Module 2: Ron Calabrese	ronald.calabrese@emory.edu
Module 3: Victor Faundez	faundez@cellbio.emory.edu
Module 4: Randy Hall	rhall@pharm.emory.edu
Module 5: Subhabrata Sanyal	ssanya2@emory.edu
Module 6: David Weinshenker	dweinsh@emory.edu

TAs

Mallory Bowers	mbowers5@emory.edu
David Nicholson	dnicho4@emory.edu

IBS 522 GRANT WRITING: HYPOTHESIS DESIGN AND SCIENTIFIC WRITING

Grants Class, Spring 2013

IBS 522, Tuesday 3:10-4:30pm

Course Director: Lisa Parr

Class TA: Constance Harrell, csharre@emory.edu

Office hours: by appointment, Yerkes #4214 Neuroscience Bldg. 404-727-3653

Location: Yerkes Neuroscience building 4th floor seminar room. The course will meet weekly for lecture and until everyone is comfortable working on their grants independently.

Course Description:

It is the goal of most scientists to secure funding for their research. While this process can be challenging at best and downright painful at worst, it is a necessary skill that should be tackled with careful planning, attention to detail, and optimism. The goal of this class is to provide you with preparatory skills to write a successful grant. The model for the course will be the NIH short grant format, a 6-page grant that includes a 1-page Specific Aims section (7 pages total). In the course, you will work with instructors, assigned faculty mentors, and fellow students, to develop and write this grant.

Mentors: When the course begins, you will be paired with 2 faculty mentors and one 3rd year student mentor who will give you feedback throughout the semester. There are 4 required, graded meetings designed to give you feedback on each major component of the grant. You are welcome to meet more often, but you must meet at least 4 times. **It is a good idea to schedule these meetings as soon as you receive your mentor pairings.** In order to get the best feedback, you have to keep up with the assignments and submit your grant draft to your mentors *BEFORE* your meeting. Failure to do this has consistently led to poor grade evaluations from mentors.

Grade: A final (letter) grade will be derived using three equally weighted criteria. ***First***, you must meet the course deadlines. The only exceptions to this will be if you obtained permission from the Course Director prior to the deadline. Failure to meet a deadline will result in 10% deduction on final grade. This is designed to keep you on schedule. You cannot write your grant in the last few weeks of the semester. You can always go back and change or modify parts of your grant, but don't delay starting a section because you are still working on a previous section. ***Second***, you will be graded by your mentors according to the progress you show during the development of your proposal. This will include making your scheduled meetings, turning in solid drafts, and how you respond to the feedback that they provide. These meetings should be treated as professional academic interactions.

The ***final*** portion of your grade will be the average of the Overall Impact Scores obtained from the student and faculty study sections. How the score is derived is explained below.

Because this is a graded class, based on a written assignment (your grant), **the writing involved is to be entirely your own**, not something written and/or edited by others or previously submitted for another course. Grant development, however, requires feedback and discussion, so you are strongly encouraged to seek the input of your advisor and fellow lab members. However, because the writing is to be entirely your own, the best advice I can give you is to avoid having any written feedback. Try and get feedback through conversation. Do not email your grant to someone for feedback as they are likely to edit the writing and then it would no longer be only your work.

Student study section: Your fellow Neuroscience graduate students will meet to critique your grant in the first step of the study section review. This will use the criteria from the NIH peer review process (see below). You will be provided with written feedback from this review and be allowed to make changes before submitting your final grant, which will be submitted to the faculty study section.

Faculty study section: In the final part of your peer review, Neuroscience faculty will meet to discuss your final grant, also using the criteria outlined by NIH. The overall impact scores from the student and faculty study sections will be averaged to obtain this grade.

NIH scoring process: NIH reviews grants according to 5 Core criteria including Significance, Investigators, Innovation, Approach and Environment. Each of these sections is given a score from 1 (best) to 9 (worst). An additional Overall Impact Score is given that reflects the overall evaluation of the application. This is usually close to the average of the 5 scores but does not have to be. For example, the overall impact score could be lower than the average if reviewers were really excited about the project, despite some flaws, or it could be lower if there were overall concerns. The average of the Overall Impact Scores is multiplied by 10 to obtain the final score, making 10 the best possible score and 90 the worst. For this class, we will review each section of the grant, e.g., **Specific Aims, Significance, Innovation, and Approach**, using the 1-9 scoring system, as well as provide you with a final Overall Impact Score. For grading, the Overall Impact Scores will be averaged for the student and faculty study section to provide this component of your final grade.

Class schedule and Assignments:

Jan 15: Review syllabus, ethical considerations, mentor assignments, discuss class format and assignments and grading. Brief overview of grant sections. Specific Aims.
Assignment: Work on specific aims bullet points, prepare 2-3 sentences about projects' broad significance, e.g., introductory sentences (2 min per person, 1 slide or handout)
Due: n/a

Jan 22: Presentations of broad significance, Clarity of writing.
Assignment: Expand bullet points and prepare slide combining broad significance with Specific aims
Due: 2 min or 1 slide/handout of broad significance of your project

Jan 29: Significance and Innovation. Presentations on Sig + Specific Aims
Assignment: Complete Specific Aims page, MENTOR MEET 1. Prepare innovation slide
Due: Presentations stating overall/broad significance and specific aims (2min, 1 slide or handout)

Feb 5: Deconstruct Approach Section: Introduction, Justification and Feasibility, Research Design, Expected Outcomes, Potential Problems. What are preliminary data?
Assignment: Begin Significance Section and Bullets for Innovation. Prepare one piece of preliminary data.
Due: Mentor 1 comments (by email). Innovation slide (2min per person)

Feb 12: Approach cont. Preliminary data presentations.
Assignment: Continue working on Significance and Innovation. Begin working on Approach, Research Design.
Due: Preliminary data slide or handout (2min per person)

Feb 19: Ethics discussion, Peer review, Constructive criticism. How does this class differ from the NRSA?
Assignment: Work on Approach section, MENTOR MEET 2 (Sig/Innovation)
Due: n/a

Feb 26: Guest lecture, Dr. Ellen Hess "NIH structure and peer review overview
Assignment: Continue working on Approach Section
Due: n/a

March 5: Preparing an NIH CV: Content and structure
Assignment: Continue working on Approach section
Due: Mentor 2 comments (by email)

March 12: Spring Break, no class

March 19: No class.
Assignment: MENTOR MEET 3 (Approach)
Due: Complete draft of Approach section

March 26: Class if needed
Assignment: Continue revising entire grant
Due: Mentor comments 3 (by email)

April 2: Class if needed
Assignment: n/a
Due: Draft of entire grant, MENTOR MEET #4 (entire grant)
You have 1 week to incorporate mentor feedback and polish your grant before turning in for Student Study Section Review

April 9: No class
Due: Mentor comments 4 (by email)

April 16: Grants due for student study section

After April 23: You will receive written feedback from Student Study Section. You can use this feedback to make changes before final grants are due.

****April 30: **FINAL GRANTS DUE****

NS570R FALL 2013 – NEUROSCIENCE: PROFESSIONAL DEVELOPMENT, COMMUNICATION AND ETHICS

Course Directors

Machelle Pardue	mpardue@emory.edu	VA Medical Center, Rm. 4A-103A
Shawn Hochman	shochm2@emory.edu	644 Whitehead Biome Res Bldg

TA

Maylen Perez Diaz	mperezd@emory.edu	2nd year Neuroscience graduate student

Location WH600, Wednesdays, 3:30-5:30pm

Summary:

The first year of graduate studies is filled with many new experiences and choices that will impact your career. Accordingly, the first goal of the fall semester is to provide a practical guide to navigate this new environment. The following important areas will be covered:

- How to develop a career plan
- Tips for selecting research rotations and mentors
- Evaluating time management and work/life balance in the research setting
- How to navigate the lab environment for the optimal graduate experience
- The art of effective communication
- How our identity biases our behavior and chances to succeed
- How to network in research to get ahead

Your PhD should be viewed as a stepping-stone to a broad palette of career opportunities. Accordingly, various career options will be discussed and the course will include guest speakers to ensure you:

- Become familiar with different career paths available after obtaining a doctoral degree

Last, the research environment introduces students to important ethical issues that deserve serious consideration. A clear understanding of responsible research practice, including the unique ethical implications of neuroscience research itself are important to a successful career. In fact, the NIH and the Laney Graduate School require regular training in such research conduct topics in order to be awarded fellowship grants and advance to candidacy in your doctoral training. Bioethics and neuroethics will be discussed with the assistance of guest lecturers. You will be required to participate in the following activities.

- Exploring concepts and case studies in ethics of data management
- Explore concepts in neuroethics

Grading:

A Satisfactory/Unsatisfactory grade will be issued for the overall course.

A Satisfactory grade will be assigned if you attend on time, participate regularly in all of the required sessions and complete all of the assignments.

An Unsatisfactory grade will be assigned if you have more than one unexcused absence (or are more than 10 min late to a class), and/or do not actively participate in the sessions on a regular basis, and/or fail to complete all of the assignments,

and/or do not prepare adequately for your presentations. Laboratory work is not considered an excuse to miss class, so please plan accordingly.

Course Guests

Rachael Stewart Allen	restewa@emory.edu	Neuroscience graduate student
James Burkett	james.p.burkett@gmail.com	Neuroscience graduate student
Paul Evans	pevansj@emory.edu	Neuroscience graduate student
Ming Fai Fong	mingfaifong@gmail.com	Neuroscience graduate student
Shannon Gourley	shannon.l.gourley@emory.edu	Emory Neuroscience Faculty
Naomi Kleitman	naomi@chnfoundation.org	VP Research, Craig Neilsen Foundation
Jordan Kohn	jordan.n.kohn@emory.edu	Neuroscience graduate student
Stephen MacDonald	scmacdonald@gmail.com	Biotechnology Consultant
Callie McGrath	clmcgra@emory.edu	Neuroscience graduate student
Christina Nemeth	clnemet@emory.edu	Neuroscience graduate student
Bill Newnam	wnewnam@emory.edu	Barkley Forum Debate Coach
Karen Rommelfanger	krommel@emory.edu	Postdoc, Center for Ethics
Jim Ross	jross@axionbio.com	Chief Technical Officer, Axion Biosystems
Paul Wolpe	pwolpe@emory.edu	Director, Center for Ethics

Date	Topic	Presenter	Materials/Assignment
Aug 28	**Professional Development I:** Course Overview /Finding the right lab (Rotations, Adviser-Mentor, Projects) / Individual Development Plan	**Shawn**	• Establishing a Mentoring Relationship • How to choose a good scientific problem • http://myidp.sciencecareers.org/
Sep 4	**Professional Development II:** Time Management/Work/life balance/Dealing with Stress, (allocation of activities vs. career impact/ Expectations of work ethic)/	**Machelle** **Paul Evans, Christina Nemeth, Callie McGrath** (Upper year students known for expert time management) **Jordan Kohn** (stress management and meditation)	• Checklist summary • Importance of stupidity • Skill Development in Graduate School • Unconventional wisdom
Sep 11	**Professional Development III:** The laboratory environment: Leadership and Data Management (Machelle out)	**Shawn** James Burkett Rachael Stewart Ming Fai Fong	• Checklist summary • Career Basics 2007, Ch. 6 • At the Bench, Ch. 1, 4-6
Sep 18	**Professional Development IV:** The Art of Effective Communication	**Shawn; Bill Newnam** (Associate Exec Director, Barkley Forum, Emory Univ)	• The science of persuasion scientificamerican2001 • Summary of "How to Win Friends and Influence People" (Dale Carnegie - 1936)
Sep 25	**Professional Development V:** Networking / Collaborating (Shawn gone)	**Machelle,** **Stephen MacDonald** PhD (patent agent/law office/MBA/consultant/Board Trustee at Ron Clark Academy)	• Assignments weeks prior related to topic; e.g. here create a LinkedIn account • AAAS building relationships 2011, ch. 2-3 • Career Basics 2007, ch 4

Oct 2	**Professional Development VI:** Conflict Management (Different Personalities; Difficult conversations) / Career trajectories (Machelle out)	**Shawn** **Outline career possibilities**	strategies
Oct 9	**Career Options I:**	**Jim Ross,** (Founder Axion Biosystems) **Tracy McGill** (lecturer, Emory) **Jill Adams** (scientific writer; tentative)	Students need to submit questions/class participation
Oct 16	**Career Options II:** Different academic tracks (Shawn out)	**Machelle** (Atlanta VA Medical Center) **Liberal arts faculty (pending)** **Shannon Gourley** (junior faculty soft money perspective)	Students need to submit questions/class participation
Oct 23	**Career Options III:**	**Naomi Kleitman PhD.**	**Students need to submit questions/class participation**
Oct 30	**Neuroethics I:**	**Paul Wolpe** (Center for Ethics, Emory)	Get Paul/Karen to provide some papers to read
Nov 6	**Professional Development VII:** Elevator talk session / What to say during a press interview (Shawn out)	Machelle	
Nov 13	SFN – no class		
Nov 20	**Neuroethics II:** Stereotype Bias	**Shawn, Maylen** **Karen Rommelfanger** (Program Director of the Neuroethics Program, Center for Ethics, Emory)	Stereotypes and the Fragility of Academic Competence, Motivation and Self-Concept. Aronson and Steele, Chapter 24 IN Handbook of Competence and Motivation 2005
Nov 27	Thanksgiving		
Dec 4	**Neuroethics III:**	**Karen Rommelfanger** (Program Director of the Neuroethics Program, Center for Ethics, Emory)	Discuss two papers • Reasons Scientists Avoid Thinking about Ethics (Cell, 2006) • Neurotalk: improving the communication of science research (Nature Reviews, 2010)

NS570R SPRING– NEUROSCIENCE: PROFESSIONAL DEVELOPMENT, COMMUNICATION AND ETHICS

Spring 2014 Course Directors: Robert Liu and Francisco Alvarez

TA:

A critical component of graduate school training is learning how to effectively convey research findings to different audiences. During a research career, this primarily occurs in the form of oral presentations, poster presentations, published manuscripts, grant applications and didactic classroom sessions.

All of these media require the effective translation of scientific literature or your own work into presentations that are accessible to broad audiences, often containing experts and non-experts alike. These presentations will very often generate ethical questions that need to be carefully considered and addressed in a thoughtful and careful manner. The goal of this course is for each student to understand the needs, abilities, and knowledge gaps of different audiences and to learn the tools that are needed to effectively plan and implement different kinds of presentation. In so doing, the student will also become attuned to the best ways of giving and receiving constructive criticism. The successful completion of course NS570R requires becoming proficient in several communication formats and will give each student the necessary experience to develop into a confident speaker and an understanding teacher. Specifically, this year long course, meeting for 1-2 hours per week over ~35 weeks is designed to give students practical experience in developing their abilities in communicating scientific advances and neuroethical concepts to different audiences. During the academic year, everyone in the class will be required to:

• Attend didactic and practical sessions on classroom teaching

• Design and implement a lesson plan for teaching a neuroscience topic to students in a local school. This will be done as part of Brain-Awareness week/month. Responsibilities will include the development and revision of lesson plans according to peer feedback and your own classroom observations and working with area teachers and the Atlanta Chapter for Neuroscience to schedule and deliver lessons.

• Present a 20-minute podium presentation describing the findings of a 2011-12 laboratory rotation

• Present a research poster summarizing the findings of a laboratory rotation

A Satisfactory grade will be awarded to students who complete all of the assignments and attend *and participate in* all of the required sessions. An Unsatisfactory grade will be awarded to students who have more than one unexcused absence per semester, those who do not participate in the sessions or those who fail to complete all of the assignments.

NS 790: SECOND YEAR ADVANCED SEMINAR IN NEUROSCIENCE

Scheduled Meeting Time: Mondays 2:30 p.m. to 4:30 p.m.

Class Location: Whitehead 600

Course Directors: Gretchen Neigh gmccand@emory.edu Andrew Escayg aescayg@emory.edu

Hint for Success in this course:

Deadlines are hard deadlines – just like grant deadlines.

Students in previous years have received an incomplete for not completing assignments on time. We will enforce deadlines in this manner again this year.

September 9th

Brief intro to the class and assignment for next week (15 min)

Week 1: "How does one find a thesis topic?"

- Faculty and senior student panel
- Small groups to discuss the students' potential ideas – brainstorming (also experience in more informal discussions of scientific ideas with diverse neuroscience audience)
- End with large group discussion of potential ideas and remaining questions
  ASSIGNMENT: J. Neuroscience paper to be critiqued for next week – *email critique to instructors BEFORE CLASS on September 16th. Failure to turn in the critique before class will result in you having to complete an additional critique on an alternate manuscript of the instructor's choosing.*

September 16th

Week 2: Mentoring (Ethics 1 hr) – David Weinshenker, Kerry Ressler

Week 2 (hour 2): small groups to discuss manuscripts used for critiques

ASSIGNMENT: Revise critique and *email to instructors BEFORE class on September 23rd*.

September 23rd

Week 3: How to write a Specific Aims Page – Becky Kinkead

ASSIGNMENT: Prepare for elevator talks session next week (directions will be provided closer to the class date). Write first draft/outline of potential specific aims and *send via email BEFORE Sunday, October 20th.*

September 30th

Week 4: Impromtu Speaking/Elevator Speech - Pat Marsteller

Professional written communication - TBD

October 7th

Week 5: Authorship (Ethics 2 hr) – Yoland Smith

ASSIGNMENT: ***REMINDER: Aims must be emailed to the instructors BEFORE SUNDAY, OCTOBER 20th.***

October 14th

NO CLASS – FALL BREAK

October 21st -

Week 6: Brainstorming/Active Revision

- Students will bring specific aims with them to class (to exchange with other students – should have already been emailed to the instructors by this point)
- Small groups to exchange aims, read, and discuss
- Return critiques given to faculty on September 23rd (faculty grading)
- Discuss the critiques briefly and any common issues/themes for improvements (individual discussions if needed or schedule those outside of class)

October 28th
Week 7: See presentation by third year student and then review qualities of good presentation and set goals for individual presentations (based on feedback from presentations given in first year)
**design rubric for presentation feedback to use in following weeks (in class project)
**set schedule for presentations starting on November 18th

November 4th
NO CLASS – GRADED CRITIQUES OF J. NEUROSCI ARTICLES COMPLETED THIS WEEK

November 11th
NO CLASS – SFN Conference

November 18th
November 25th
December 2nd
December 9th
- Student Presentations of Aims (see attached)
- Presentations are 20 min with 10 min of questions
- 4 presentations per week

Learning Objectives for the Course:

- Students should be able to critically evaluate published written science.
- Students should be able to critically evaluate the proposed ideas of other students in a constructive manner.
- Students should be able to discuss their research ideas both informally and formally.
- Students should know the difference between a critique and a peer review.
- Students should know the aspects of a specifics aims page and be able to compose one relevant to their potential thesis work.
- Students should be able to listen to the scientific ideas of a diverse range of neuroscientists and engage in constructive discussion of the topic, techniques, and potential outcomes.

Grading of Course:
The designation of pass or fail will be made based on the following:

- Attendance and participation
- Successful completion of all assignments ***ON TIME***. Handing in an assignment late could result in having to repeat the assignment and in some cases this can lead to an incomplete. If a specific time is given for the assignment, in addition to the date, this is a hard deadline. Granting agencies set specific times for deadlines, even a minute past the deadline and the submission is rejected. We will not reject your late assignment, but we will subtract a full letter grade for your assigned test score for every hour past the deadline. You have to
- get a B to pass the class.
- Successful completion of the graded critique of a *J. Neurosci* article
- Attention to goals set for presentation of thesis aims

Critique Guidelines

J. Neurosci. Papers Only

The following guideline should be used in preparing your critique. Feel free to organize your critique using the following items as headlines or subtitles. Remember that your critical analysis should include both strengths and weaknesses in a balance that accurately assesses the overall value of the paper.

A. The critique should begin with a brief (recommend <1 page) description and critical assessment of the
   1. background knowledge directly relevant to the issues addressed by this study.
      a. Include answers to the following questions:
   2. What are the specific, preceding experiments and models which motivate the current study?
   3. Is the general question addressed by this study important?

B. Clearly identify the broad hypothesis(es) tested by the present study.

C. For each experiment in the paper being critiqued address the following points. From this assessment, it should be crystal clear why each experiment was performed and how it is important to reaching the final conclusions.
   4. A clear statement of the specific hypothesis tested.
   5. Critical assessment of the suitability of the experimental assay to the hypothesis being tested.
   6. Critical assessment of the results and their value in testing the hypothesis.

D. Critical assessment of the success or failure of the study in meeting the stated aims or testing the stated hypotheses of the paper. Identify the major contributions of the paper.

E. Give your thoughts about future directions of this work.

Most successful critiques are approximately 5 pages in length ± 1 page.
****NOTE: These instructions are identical to those that will accompany the written exam.****

Guidelines and Goals for NS790 Practice Thesis Presentation

Guidelines:

Give oral presentation on what intend to do for thesis lasting approximately 30 minutes (20 minute presentation followed by 10 minutes of questions).

1. Revised Specific Aims with introductory paragraph should be placed on Blackboard at least 48 hours prior to presentation.
2. Student's thesis advisor should attend, if possible. Other colleagues welcomed and encouraged.
3. Students should expect approximately 10 minutes of questions following the presentation from an audience which represents a diverse neuroscience background. The more people in your audience, the more beneficial this experience will be for you.

Goals:

1) To present the planned thesis work and clearly convey the following:

1. big picture relevance/motivation for the work
2. rationale for specific research question and supporting information (appropriate place to present your preliminary work or that of colleagues that led up to your proposed study)
3. specific aims
4. specific hypotheses that will be tested
5. approach to test the specific hypotheses (methods)
6. understanding of how the experiments proposed sufficiently address the research question
7. predicted outcomes/alternative interpretations
8. contingency plans, if necessary

2) To field questions professionally:

1. interpret and answer questions succinctly and thoroughly
2. professionally admit when unaware of answer
3. adequately address interpretation and synthesis questions – some of which may be "out of left field"

3) To deliver a polished presentation:

1. adequate slides
2. good verbal presentation skills (appropriate pace and volume)
3. good stage presence (eye contact, low level of fidgeting, appropriate use of pointer)

APPENDIX 7: GIN OFFICERS: 2013-2014

Presidents: Kara Kittelberger & Paul Evans
Treasurers: Ryan Purcell & Dan Curry
Secretary: Amy Luce
Recruitment Committee: Kim Lang & Kevin Watkins
Frontiers Coordinators: Travis Rotterman & Michael McKinnon
ENCORE Coordinators: James Burkett & Laura Jones
Executive Committee: Jodi Godfrey & Natty Chalermpalanupap
Curriculum Committee: Melanie Pincus & Kevin Watkins
DSAC Representative: Kathy Reding
GSC Representatives: Paul Evans & Dan Curry
Webmaster: Lukas Hoffman
Newsletter Editors: James Burkett, Tyra Lamar, Don Noble, & Jacob Billings