

**2007-2008**

**STUDENT GUIDE**

***GRADUATE TRAINING  
IN NEUROSCIENCE***

***EMORY UNIVERSITY***

## TABLE OF CONTENTS

	<u>Page</u>
<b>I. Purpose and Goals of the Graduate Program</b> .....	2
<b>II. Philosophy of Graduate Training</b> .....	2
<b>III. Admission</b> .....	3
<b>A. Criteria</b> .....	3
1. Undergraduate Curriculum .....	3
2. Research Experience .....	3
3. Graduate Record Examination .....	3
4. Recommendations .....	3
5. Statement of Goals .....	3
6. Evaluation .....	4
<b>B. On Arrival</b> .....	4
<b>C. International Students and Language Requirements</b> .....	4
<b>IV. Director and Executive Committee</b> .....	4
<b>V. Advising</b> .....	5
<b>VI. Laboratory Research Rotations</b> .....	5
<b>VII. Course</b> .....	7
<b>A. Required Courses</b> .....	7
<b>B. Elective Courses</b> .....	9
<b>C. Rotation and Research Credits</b> .....	9
<b>D. Frontiers in Neuroscience</b> .....	10
<b>E. Events Sponsored by Atlanta Chapter         of the Society for Neuroscience</b> .....	10
<b>F. Journal Clubs and Common Interest Groups</b> .....	11
<b>VIII. Grades</b> .....	11
<b>IX. Selection of Research Advisor</b> .....	12
<b>X. Selection of Dissertation Committee</b> .....	13
<b>XI. Qualifying Examination</b> .....	14
<b>A. Written Exam</b> .....	14

B. Oral Examination.....	15
C. Preparation.....	17
<b>XII. Admission to Ph.D. Candidacy .....</b>	<b>18</b>
<b>XIII. Teaching Experience - TATOO Requirements.....</b>	<b>18</b>
A. Summer Teaching Workshop .....	18
B. Division Program Experience “Teaching in the Biosciences” .....	19
C. Teaching Assistantship.....	19
D. Teaching Associateship.....	19
<b>XIV Dissertation Research .....</b>	<b>20</b>
<b>XV. Submission of Ph.D. Dissertation .....</b>	<b>20</b>
A. Approval of Committee .....	20
B. Guidelines for Writing and Submission.....	20
C. Submission of the Dissertation.....	20
D. Final Thesis Committee Meeting.....	20
<b>XVI. Defense of Ph.D. Dissertation.....</b>	<b>21</b>
A. Public Dissertation Defense .....	21
B. Private Dissertation Defense .....	22
C. Revisions .....	22
<b>XVII. Awarding of Degree .....</b>	<b>22</b>
A. Deadlines.....	22
B. Degrees .....	22
1. Master of Science.....	22
2. Doctor of Philosophy .....	23
<b>XIII. Tenure of Graduate Studies .....</b>	<b>23</b>
<b>XIX. Expectations of Performance.....</b>	<b>24</b>
A. Expectations of Faculty for Students .....	24
B. Expectations of Students for Faculty .....	25
<b>XX. Student - Faculty Communication .....</b>	<b>25</b>
<b>XXI. Financial Support.....</b>	<b>26</b>
<b>XXII. Policy Regarding Outside Employment.....</b>	<b>26</b>

<b>XXIII. Leaving the Program</b> .....	27
<b>A. Beyond the Ph.D.</b> .....	27
<b>B. Poor Performance</b> .....	27

<b>XXIV. University Requirements</b> .....	28
--	----

**APPENDIX**

<b>A1. Typical Schedule</b> .....	29
<b>A2. Elective Courses for Neuroscience Students</b> .....	31
<b>A3. Listing of Neuroscience Faculty</b> .....	32
<b>A4. Neuroscience Program Administration</b> .....	38
<b>A5. Neuroscience Graduate Student Directory</b> .....	39
<b>A6. Rotation Proposal Form</b> .....	42
<b>A7. Rotation Evaluation Form</b> .....	43
<b>A8. GDBBS Mentor Assignment Agreement</b> .....	44
<b>A9. Dissertation Committee Checklist</b> .....	46
<b>A10. Dissertation Advisory Committee Report</b> .....	47
<b>A11. Provisional Dissertation Approval Form</b> .....	49
<b>A12. Required Course Outlines</b> .....	50
<b>A. IBS 555 – Principles of Basic Biological &amp; Biomedical Sciences</b> .....	50
<b>B. IBS 526 - Neuroanatomy &amp; Systems Neuroscience</b> .....	52
<b>C. IBS 514 – Cellular, Molecular and Developmental Neuroscience</b> .....	56
<b>D. IBS 551 - Techniques in Neuroscience</b> .....	60
<b>E. IBS 522 - Grant writing</b> .....	62

# **STUDENT GUIDE TO GRADUATE TRAINING IN NEUROSCIENCE AT EMORY UNIVERSITY**

## **I. Purpose and Goals of the Graduate Program**

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 18 Departments, such as - of Cell Biology, Biochemistry, Biology, Chemistry, Neurology, Neurosurgery, Pharmacology, Physiology, Psychiatry, Psychology and Rehabilitative Medicine and from the Yerkes Regional Primate Lab, the Center for Behavioral Neuroscience, the Center for Neurodegenerative Diseases, Genetics, Pediatrics and Emergency Medicine.

## **II. 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.

### **III. Admission**

**A. Criteria.** Each applicant is judged on the merits of his or her overall record. A minor deficiency in any one area will not necessarily exclude the applicant from admission, especially if compensated for by exceptional strength in other areas.

1. *Undergraduate Curriculum:* Preference will be given to applicants who have taken courses in general and organic chemistry, general physics, calculus and general biology. Biochemistry is also strongly recommended. Applicants should have an overall undergraduate grade point average (GPA) of "B" or better (i.e., at least 3.0 on a scale of A = 4.0). Applicants who have taken graduate-level courses should have at least a "B" average in these.
2. *Research Experience:* Preference will be given to those students who have worked and performed well in biomedical research laboratories, preferably dealing with Neuroscience-related research. Letters of recommendation from the advisor who supervised the students for these trainings are very important for members of the admission committee (see #4).
3. *Graduate Record Examination:* All applicants are required to take the Graduate Record Examination (GRE). A minimum combined score of 1200 for the verbal and quantitative is generally required. Advanced sections are not required. Applicants whose native language is not English can be accepted with a total GRE score of less than 1200 if the score on the quantitative part is at the 80th percentile or higher. All such applicants must also take the Test of English as a Foreign Language (TOEFL).
4. *Recommendations:* Three evaluations are required from individuals who are familiar with the applicant and his/her capabilities. Considerable weight is given to recommendations by faculty members or other individuals who have first-hand knowledge of the academic and research potential of the applicant.
5. *Statement of Goals:* Applicants should provide a clear, concise statement of their reasons for wanting to enter a graduate training program in neuroscience, and indicate how such training fits into their long range career goals.

6. *Evaluation:* Completed applications are evaluated by a committee comprised of faculty and students from a broad range of departments and interests in the Neuroscience Program and chaired by an Admissions Director who is a member of the Executive Committee. Personal interviews with the applicant are usually a part of the application process. Usually, between 10 and 20 students can be admitted to the program each year, typically in the Fall Semester.
- B. *On Arrival.*** Incoming students will be sent information several weeks prior to registration. An incoming student needing a place to stay for a short time while looking for suitable housing is encouraged to contact the Program's Director of Admissions who will put them in contact with currently enrolled students who might be able to offer temporary accommodation. Upon arrival in Atlanta, the new graduate student should contact the Program Coordinator and the Director of Graduate Studies to ascertain 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 the other students and members of the Executive Committee.
- C. *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.

#### **IV. Director and Executive Committee**

The graduate program is coordinated by a member of the Program faculty who serves as Program Director. In conjunction with the Director of Graduate Studies and the Executive Committee, the Director is also responsible for coordinating faculty in monitoring the performance of students, scheduling and organizing the qualifying examination, overseeing selection of research advisors and dissertation committees, and is the representative of the Program to the Graduate School Executive Committee which oversees policy and curricular matters. The Admissions Committee, which comprises NS faculty and is chaired by a member of the Executive Committee is responsible for providing information on the graduate program to prospective applicants and overseeing admissions. The 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.

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. Nominations for the position of Director, Director of Graduate Studies, Chair of the Admissions Committee, and member of the Executive Committee are solicited from faculty in the program by a Nomination

Committee comprised and chaired by faculty members who are not members of the Executive Committee. This committee presents a recommended list to the Executive Committee with alternates and final selection is made by the Executive Committee. The Executive Committee terms will be for three years 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 four members of the Executive Committee can be from any one department.

## **V. Advising**

Upon entering the Neuroscience Program, the Director of Graduate Studies will serve as a temporary advisor until each student has chosen a thesis advisor. A thesis advisor must be requested and approved by the Director of Graduate Studies (DGS) in writing, during the student's second year as detailed below. In cases where the DGS sees potential problems the request may be brought before the Executive Committee for approval.

## **VI. Laboratory Research Rotations**

During the first two years 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 faculty with whom the student has rotated. The laboratory research rotations also provide the faculty with an opportunity to observe and evaluate the performance of beginning students in a research setting.

**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 a S/U grade. It is recommended that students begin their first rotation in the Spring semester, and complete their third rotation by the end of the summer between years 1 and 2. However, students may begin a rotation in the Fall semester if they feel comfortable with the course load. 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, 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 the

rotation period. The registration deadline for these rotations is May 01. The typical starting dates for these rotations is June 01 or July 01.

The schedule of rotations for each student will be arranged by the student in consultation with the Director of Graduate Studies. 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 web site ([www.emory.edu/NEUROSCIENCE](http://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 and arrange to 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.

After selecting a rotation advisor, each student must send a Rotation Proposal Form (Appendix 10) 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 in. 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 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 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 the laboratory of someone who is not a member of the Neuroscience Program must receive prior approval by the Director of Graduate Studies.

At the end of each rotation, students are required to submit a progress report that summarizes the work they have accomplished to the Director of Graduate Studies. This report must be signed by both the student and the advisor and must be submitted to the DGS **no later than two weeks after the completion of each rotation. Since students work in labs for the entire summer, reports are due the last week of August prior to the beginning of Fall classes. Students who have not submitted a rotation report by the due date will receive an incomplete for the rotation.** According to Graduate school guidelines, any student who receives an incomplete for two or more courses will be automatically terminated from the graduate program. **If the rotation report is not received within 2 weeks after the end of the semester, the incomplete will be changed to an Unsatisfactory.**

At the end of each rotation, **advisors** are required to submit a Rotation Evaluation Form (Appendix 11) **(signed by both the student and the rotation advisor)** of completion of the rotation with S/U grade to the Director of Graduate Studies. The rotation grade (S/U) should be submitted to the Director of Graduate Studies **prior to final exam week** so that the grade may be submitted. **Since students work in labs for the entire summer, the rotation**

**evaluations are due the last week of August prior to the beginning of Fall classes The advisor must discuss the content of this evaluation with the student before sending it to the DGS.**

**The purpose of the rotation is not to complete a research project and no student is obliged to continue a rotation beyond the exam period or the start of the next term. The 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 their respective expectations 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.

## **VII. Courses and Related Program Requirements**

**A. Required Courses.** The overall course requirements to obtain a Ph.D. are published in the Graduate School of Arts and Sciences Handbook. The following courses are usually required for all Neuroscience students. A typical schedule is shown in appendix 1.

<b>Course Number</b>	<b>Course Title</b>	<b>Credits</b>
<b><u>Semester 1 (Fall)</u></b>		
IBS 526	Neuroanatomy and Systems Neuroscience	7 Credits
IBS 555	Principles of Basic Biomedical/Biological Sciences	6 Credits
NS 551	Techniques in Neuroscience	1 Credit
NS 570R	Introductory Graduate Seminar (S/U)	2 Credits
IBS 530R	Frontiers Seminar(S/U)	1 Credit
<b><u>Semester 2 (Spring)</u></b>		
IBS 514	Cellular & Developmental Neuroscience	3 Credits
NS 570R	Introductory Graduate Seminar (S/U)	2 Credits
NS 597R	Laboratory Rotation (S/U)	6 Credits
IBS 530R	Frontiers Seminar(S/U)	1 Credit

### Summer (between years 1 & 2)

GRAD 004S Graduate Residence 0 Credit  
During the summer term students should register for GRAD 004S (Graduate residence). However, students are expected to complete one or two laboratory rotations during the first summer. The summer rotation is considered particularly important, because it provides an opportunity to spend full time doing research.

### Semester 3 (Fall)

NS 597R	Laboratory Rotation (Summer credit) (S/U)	2-3 Credits
	Electives and Research	3-10 Credits
NS 790R	Advanced Seminar (S/U)	2 Credits
IBS530R	Frontiers (S/U)	1 Credit
IBS 606	Values in Science	1 Credit

Students should register for a Fall rotation in order to gain transcript credit hours for their Summer rotation.

### Semester 4 (Spring)

BIOS 505	Design & Analysis of Experiments	4 Credits
IBS 522	Grant Writing	2 Credits
IBS 530R	Frontiers (S/U)	1 Credit
	Electives and Research	8-10 Credits

For the entering class of 2006 & 2007 -First year students are required to take the Introductory Seminar, NS 570R during both Fall and Spring semesters, while the second year students must take Advanced seminars NS790R in the Fall semester. Third year students must take advanced seminars during the Spring semester only. In the Fall they will have their oral examination (see below). Their role in the Spring 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 are not required to take seminar. They should, however, register for Advanced Seminar in the Spring to get credit for mentoring the third year students' oral exam (see below).

During the Fall semester of advanced seminar, second year students will be expected to 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 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.

Seminar requirements for MD/PhD students are as follows: During their first year M1 students are required to attend Frontiers (enroll for IBS 530R, 1 credit) and enroll for Introductory seminar (NS 570R, 2cr) during the Fall and Spring semesters. M2 students are not required to enroll for graduate classes (except for a lab rotation-NS 597R- in the Spring semester), but are strongly encouraged to attend Frontiers seminars. During G1, they should enroll for Advanced Seminar, NS790R, and Frontiers (IBS 530R) in the Fall. In the Spring, they must enroll in IBS 522 Grant Writing course and Frontiers. MD/PhD students are also required to take Design and Analysis of Experiments (IBS 538) and one elective course. In addition, based upon the student's background, performance and interests, they will discuss all other required graduate coursework with the DGS of the Neuroscience Program. Although they do not have to register and pass exams of IBS 526 (Neuroanatomy and Systems Neuroscience) and IBS 514 (Cellular and Developmental Neurosciences), MD/PhD students are strongly encouraged to audit these two courses.

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 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.

***B. Elective Courses.*** The students must also 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 is required by the program**, but students are encouraged to pursue all those electives directly relevant to their development as a neuroscientist. A Neuroscience Elective list is provided as an Appendix (A2). Students are encouraged to select their required elective from the strongly recommended group on the elective list but 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 to the curriculum 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 to get an updated list of electives when comes the time to enroll.**

***C. Rotation and Research Credits.*** **During any given semester, each student must register for at least 12 credit hours to maintain status as a full-time student.** After the first year, this requirement is usually accomplished by registering for a combination of formal courses and research credits for time that will be spent in the laboratory. During 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, students should register for GRAD 004S (Graduate residence) for 0 credit hours. The rotation hours are credited to the following Fall semester (2 or 3 hours). After completion of the required laboratory rotations students should not continue to register for NS 597R. After the student has finished the laboratory rotations and selected a permanent research advisor he or she should register for NS 799R (Dissertation 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 12 credit hours.

***D. Frontiers in Neuroscience.*** This is a weekly seminar series in which various topics in modern neuroscience are discussed. Seminars are often presented by faculty or postdoctoral fellows in the program. 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 Frontiers in Neuroscience. **Attendance is required for all students in their first two years and only two cuts per semester are permitted.** Students in their first two years are assigned one credit for attendance and given an S/U grade each semester.

***E. 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 other Universities in the Atlanta area, including 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 Neuroscience meeting during their tenure at Emory. These presentations can be given as oral slide presentations 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 and provides an opportunity for those who will be presenting at the meeting to present their poster to 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.** A sub-committee of the Executive 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: During that month 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.

iii. Spring Neuroscience Symposium - Each Spring the Atlanta Chapter of the Society for Neuroscience sponsors a symposium on a specific topic in Neuroscience. Speakers generally include one Atlanta area neuroscientist and several speakers from other universities or research institutions. The Symposium provides an opportunity for students to gain a current overview of specific areas of neurobiology and to meet internationally recognized neurobiologists from other institutions. The evening before the Symposium, senior students in the program present their dissertation research to the assembled chapter. These presentations provide an opportunity for students to receive feedback on the work that will compose their thesis from a wide neuroscience audience.

iv. Seminars and Grass 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. 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.

*F. 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, areas of special strength in the Program are often represented by specific journal clubs or common interest groups distributed across departments and centers throughout the university. 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.

## VIII. 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. All appeals will be reviewed by the Neuroscience Program Executive Committee and the GDBBS Executive Committee. 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 the student receives a grade of C or F in any one of the three core Neuroscience courses (IBS 526: Neuroanatomy & Systems Neuroscience, IBS 514: Molecular, Cellular and Developmental Neuroscience, IBS 555: Principles of Biomedical and Biological Sciences), 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 hours (24 of which in coursework) and have a cumulative GPA of at least 3.0.**

## **IX. Selection of Research Advisor**

Students **must ordinarily** 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 “Approval for PhD Thesis Advisor” form and submit this to the DGS for approval.** All choices of dissertation research advisors are subject to final approval by the DGS 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.

## **X. 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 (a statement with signature of each member should be submitted to the Director of Graduate Studies). The committee must consist of at least five members of the faculty, including the research advisor who chairs the committee. At least four members of the Dissertation Committee 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 will 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 graduate school. Some funds may be available to facilitate these arrangements.

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 September deadline for turning in the thesis proposal for the Oral Qualifying Exam in October. 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 (for years 1-5) or twice (for year 5 and more) each year for the purpose of reviewing 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 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. 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.** This form should be signed by both the advisor and the student. 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. This request will be considered by the Executive Committee 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.

## **XI. 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 in October 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. 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). This portion of the qualifying exam will be taken simultaneously by all students 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 text books; 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 answers to questions will be graded by the faculty who wrote the questions and should they seek help by the members of the Exam Committee. Each grader will assign a grade of 0 - 100% to all questions graded.

Questions will be taken from the 2 core courses in the Neuroscience Program (IBS 526 & 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.

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 in whole or in part. 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.

***B. 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 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.

### **Preparation for Oral Exam**

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. You will be responsible for ensuring that your advisor and two committee members of your choosing are present at your 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 4<sup>th</sup> year will act as mentors to 3<sup>rd</sup> year students. They will act singly or in small groups to help individual 3<sup>rd</sup> year students in formulating and/or editing the written proposal. Additionally, the 4<sup>th</sup> year students will act as a group to hold a mock oral examination for each 3<sup>rd</sup> year student.

### 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 (attached) given for an Individual National Research Service Award Application Form (PHS 416-1; Item 29b, "Research Training Proposal"). The following addendum to these instructions is based on the conventional format used in preparing NIH research grants and is meant to direct and assist you in preparing the written research proposal for Part II of the Qualifying Exam.

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 and figures (references included) should not exceed 10 pages.
- The proposal should be single sided and single spaced, staying strictly within the following margins: top 1in., bottom 1in., left 3/4", 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 three subtitled sections (Specific Aims, Background and Significance, and Research Design and Methods) as described on page 10 of the instructions for preparing NRSA proposals.

**The completed written proposal must be submitted to the Director of Graduate Studies at a prespecified 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.**

### Oral Examination

All examinations for the students in a given class will be scheduled during a one to three days 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, a second Proposal Defense can be scheduled by the student and the Examination Committee. 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.

**C. Preparation.** 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 TATTO 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.

## **XII. 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 student, signed by the advisor, and submitted to the GDBBS office. Applications are available on-line at <http://www.emory.edu/GAOAS/forms.html>.

## **XIII. 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 faculty 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 Introductory Graduate Seminar 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 participate 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

#### **XIV. 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.

#### **XV. 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 some of the methods, results and discussion may be represented by scientific papers on which the student is first author and which have been published in refereed journals. More detailed directions as to the form of the dissertation are available from the Graduate School Office. The dissertation must be typed or printed, using a letter quality printer, on special thesis paper. Figures and other illustrations must be of publication quality. Refer to GSAS handbook for details- [http://www.emory.edu/GSOAS/student\\_handbook.html](http://www.emory.edu/GSOAS/student_handbook.html).

*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 meeting will be chaired by the DGS or his/her designated representative from the Executive Committee. All members of the thesis committee must give

provisional approval of the dissertation in writing (appendix #9). 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** 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.

## **XVI. 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 public seminar must be announced by sending a written notice to the Division 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 party 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.**

***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.

## **XVII. Awarding of Degree**

***A. Deadlines:*** The Graduate School has several deadlines which 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 ordinarily accepted. Under certain circumstances, a student may be permitted to work for a terminal M.S. degree that requires submission of an appropriate thesis.

*1. Master of Science.* A student who fails the oral Qualifying Examination may petition the faculty for permission to complete a Masters 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 Masters thesis. If the petition is approved, such a student must form a Masters 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 Masters 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 Masters 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 with the room reservation. 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 absent themselves 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.

*2. 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.

## **XVIII. 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. All graduate students are expected to complete their graduate studies within six years of enrolling in the program (five years for MD/PhD students.) If it becomes evident to a student and 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.

## **XIX. 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. It is obvious that 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 work week. 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 2 years the advisor is often 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 Frontiers in Neuroscience. Finally, faculty should counsel students in determining the direction their postdoctoral careers might take.

Faculty 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.

## **XX. 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 problems. The Director, the Director of Graduate Studies or members of the Executive Committee are obvious 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.

## **XXI. Financial Support**

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 are awarded a \$2,000 increase in their stipend level by GDBBS. Neuroscience Students have been successful at obtaining funding by submitting their Oral Exam proposal to NRSA.

It is the policy of the Division to continue support for two years for a student in good standing working for a Ph.D. Financial support after the second year 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.

## **XXII. 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.

### **XXIII. 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 themselves 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 time-table 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.

#### **XXIV. 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.

## A1. Typical Schedule

	1st Semester			2nd Semester			Summer
	Course	No.	Cr.	Course	No.	Cr.	
<b>1st YEAR</b>	Neuroanatomy/Systems	IBS 526	7	Cell/Dev NS	IBS 514	3	2 <sup>nd</sup> or 3 <sup>rd</sup> research Rotation (register for this the following fall)
	Biomed/Biol Science	IBS 555	6				
	Intro Graduate Seminar	NS 570R	2	Intro Graduate Seminar	NS 570R	2	Register for: <b>Grad Residence,</b> Full-time
	Techniques NS	NS.....	1	Frontiers in NS Seminar	IBS 530R	1	
	Frontiers in NS Seminar	IBS 530R	2				
	Laboratory Rotation	NS597R	2	Laboratory Rotation	NS 597R	2	
	<b>DEADLINES</b>		<b>DEADLINES</b>			<b>DEADLINES</b>	
	<u>Before beginning of Final Exam week:</u>		<u>Two weeks after first rotation (Spring rotation):</u>			<b>WRITTEN QUAL EXAM IN AUGUST</b>	
	- Submit first rotation proposal		- Submit first rotation report to DGS			<u>Two weeks after second rotation (1<sup>st</sup> summer rotation):</u>	
			Two weeks prior to second rotation (1 <sup>st</sup> summer rotation):			-Submit second rotation report	
			-Submit second rotation proposal			<u>Two weeks prior to third rotation (2<sup>nd</sup> summer rotation):</u>	
						-Submit third rotation proposal	
<b>2nd YEAR</b>	Advanced Grad Seminar	NS 790R	2	Frontiers in NS Seminar	NS 530R	1	Research
	Frontiers in NS Seminar	NS 530R	1				
	Dissertation Research	NS 799R	5-7	Values in Science	IBS 606	1	Register for: Grad Residence, Full-time
	Elective Courses		2-4	Dissertation Research	NS 799R	3	
				Design and Analysis of Experiments	BIOS 505	4	
				Grant writing	IBS ...	2	

<p><b>DEADLINES</b></p> <p><b><u>Two weeks after third rotation:</u></b></p> <p>-Submit third rotation report</p> <p><b><u>Before beginning of semester:</u></b></p> <p>- Select dissertation research advisor (and submit signed form to DGS)</p>	<p><b>DEADLINES</b></p> <p>Select thesis committee and submit signed form to DGS</p>	<p><b>DEADLINES</b></p> <p>Schedule first thesis committee meeting. Submit report to DGS</p>
--	--	--

	1st Semester			2nd Semester			Summer
	Course	No.	Cr.	Course	No.	Cr.	

<b>3rd YEAR</b>	Dissertation Research    NS 799R    10  <b>DEADLINES</b> <i>Oral qualifying exam in October.</i>	Adv Graduate Seminar    NS 790R    2  Dissertation Research    NS 799R    10	Research  Register for: Grad Residence, Full-time   <u>Before Beginning of exam week:</u> -Annual Committee Meeting & Report -Apply for Ph.D. Candidacy
<b>4th YEAR</b>	Dissertation Research    NS 799R    12  Advanced Grad Seminar Teaching Associateship – Mentor 3 <sup>rd</sup> year student for preparation of oral exam    NS 790R    2	Dissertation Research    NS 799R    10	Dissertation Research     Register for: Grad Residence, Full-time  <b>DEADLINES</b> <u>Before Beginning of exam week:</u> -Annual Committee Meeting & Report
<b>5+ YEAR</b>	Dissertation Research    NS 799R    12	Dissertation Research    NS 799R    12	Dissertation Research  Register for: Grad Residence, Full-time  <b>DEADLINES</b> <u>Before Beginning of exam week:</u> -Annual Committee Meeting & Report

## A2. Elective Courses for Neuroscience Students

### *Electives Strongly Recommended for Neuroscience Program Students*

IBS504	Introductory Prokaryotic Genetics	4	Fall
IBS 505	Human and Molecular Genetics	4	Spring
IBS 506R	Basic Mechan. of Neurolog. Diseases	3	Spring
IBS 512	Cell Physiology and Biophysics	4	Spring
IBS 531	Prin. Molec. Therapeutics & Toxicology	4	Fall
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
IBS 532	Introduction to Pharmacology	3	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)

#Med School Courses

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**

**A3. Listing of Neuroscience Faculty****Updated August 2007**

<b><u>NAME</u></b> (Last, First, MI)	<b><u>Title, Campus Address</u></b>	<b><u>Phone</u></b>	<b><u>Fax</u></b>
<b>Abercrombie</b> Ronald, F. (ron@physio.emory.edu)	Dept.of Physiology 605F Whitehead Bldg	727-7425	727-2648
<b>Alexander</b> Garrett E. (medgea@emory.edu)	Dept.of, Neurology 6117 WMRB	727-3576	727-3157
<b>Bachevalier</b> Jocelyne (jbachev@emory.edu)	Dept of Psychology/Yerkes Yerkes NS Bldg	727-9765	727-0372
<b>Bassell</b> Gary (gary.bassell@emory.edu)	Dept of Cell Biology #405K Whitehead Bldg	727-3772	727-0668
<b>Berns</b> Gregory (gberns@emory.edu)	Dept. of Psychiatry 4109 WMRB	727-2556	727-3233
<b>Bonsall</b> Robert, W. (rbonsal@emory.edu)	Dept.of, Psychiatry 504N Emory West	712-9853	712-9852
<b>Bremner</b> Douglas jdbremn@emory.edu	Director, PET Center Dept of Radiology, EUH	712-0108	712-7435
<b>Buffalo</b> Beth (Elizabeth.buffalo@emory.edu)	Yerkes Primate Ctr Yerkes NS Bldg	712-9431	727-3278
<b>Butler</b> Andrew ajbutle@emory.edu	Dept of Rehab Medicine 1441 Clifton Rd	712-5675	712-5895
<b>Calabrese</b> Ronald, L. (rcalabre@biology.emory.edu)	Dept.of Biology 2113 Rollins Research Ctr.	727-0319	727-2880
<b>Caspary</b> Tamara tcaspary@genetics.emory.edu	Dept of Genetics #305B Whitehead Bldg	727-9862	727-3949
<b>Chan</b> Anthony (awchan@emory.edu)	Dept of Genetics Yerkes NS Bldg	712-8347	727-3949
<b>Chen</b> Ping (pchen@cellbio.emory.edu)	Dept. of Cell Biology Whitehead Bldg, #545	727-1808	727-6256
<b>Choi</b> Inyeong (ichoi@physio.emory.edu)	Dept of Physiology 605E Whitehead Bldg	712-2092	727-2648
<b>Crutcher</b> Michael, D. (mcrutch@emory.edu)	Dept.of Neurology 6111 WMRB	727-5011/1366	727-3157
<b>Csete</b> Marie Marie_csete@emoryhealthcare.org	Dept of Anesthesiology 420 Dental Bldg.	712-2588	712-2542 778-5194
<b>Cubells</b> Joseph (jcubells@genetics.emory.edu)	Dept.of Human Genetics 7305 WMB	727-2005	727-3949
<b>Das</b> Vallabh (vdas@rmy.emory.edu)	Yerkes, Div of Visual Sciences 954 Gatewood Rd.	727-9906	727-3278 727-7729

<b>Davis</b> ( <a href="mailto:mdavis4@emory.edu">mdavis4@emory.edu</a> )	Michael	Dept. of Psychiatry 4311 WMRB	727-3591	727-3436
<b>DeLong</b> ( <a href="mailto:medmrd@emory.edu">medmrd@emory.edu</a> )	Mahlon, R.	Dept. of Neurology WMRB	727-3818	727-3157
<b>DeWeerth</b> ( <a href="mailto:steve.deweerth@neuro.gatech.edu">steve.deweerth@neuro.gatech.edu</a> )	Steve	Dept of Biomedical Engineering, GA Tech 315 Ferst Dr. Suite 1121	894-4738	894-4243
<b>Dingledine</b> ( <a href="mailto:rdingledine@pharm.emory.edu">rdingledine@pharm.emory.edu</a> )	Raymond	Chair, Dept. of Pharmacology 5001A Rollins Research Ctr.	727-5982 7-5999	727-0365
<b>Duong</b> ( <a href="mailto:tduong@emory.edu">tduong@emory.edu</a> )	Timothy	Dept. of Neurology Yerkes	727-7721	727-3278
<b>Edwards</b> ( <a href="mailto:edwards@emory.edu">edwards@emory.edu</a> )	David, A.	Dept. of Psychology 309 Psychology Bldg.	727-4128	727-0372
<b>English</b> ( <a href="mailto:art@cellbio.emory.edu">art@cellbio.emory.edu</a> )	Arthur, W.	Dept. of Cell Biology 405P Whitehead Bldg.	727-6250	727-3677
<b>Escayg</b> ( <a href="mailto:mcrutch@emory.edu">mcrutch@emory.edu</a> )	Andrew	Dept. of Human Genetics 365 Whitehead Bldg	712-8328	727-3949
<b>Falls</b> ( <a href="mailto:dfalls@emory.edu">dfalls@emory.edu</a> )	Douglas	Dept. of Biology 2129 Rollins Research Ctr.	727-0520	727-2880
<b>Finch</b> ( <a href="mailto:finch@cellbio.emory.edu">finch@cellbio.emory.edu</a> )	Beth	Dept. of Cell Biology 542 Whitehead Bldg.	727-0443	727-6256
<b>Garlow</b> ( <a href="mailto:sgarlow@emory.edu">sgarlow@emory.edu</a> )	Steve	Dept. of Psychiatry/Behav. 4313 WMB	727-3116	727-3233
<b>Glass</b> ( <a href="mailto:Jglas03@emory.edu">Jglas03@emory.edu</a> )	<b>Jonathan</b>	Dept of Neurology 505K Whitehead Bldg	727-3507	727-3728
<b>Goodman</b> ( <a href="mailto:mgoodma@emory.edu">mgoodma@emory.edu</a> )	Mark	Div of Radiology, EUH 1354 Clifton Rd NE	727-9366	727-4366/3488
<b>Gordon</b> ( <a href="mailto:fgordon@emory.edu">fgordon@emory.edu</a> )	Frank, J.	Dept. of Pharmacology 5011 Rollins Research Ctr.	727-5893	727-0365
<b>Gross</b> ( <a href="mailto:robert.cross@emory.org">robert.cross@emory.org</a> )	Robert	Dept of Neurosurgery Emory Clinic B, TEC B6209	778-5770	778-5121
<b>Hall</b> ( <a href="mailto:rhall3@emory.edu">rhall3@emory.edu</a> )	Randy, A.	Dept. of Pharmacology 5113 Rollins Research Ctr.	727-3699	727-0365
<b>Hartzell</b> ( <a href="mailto:criss@cellbio.emory.edu">criss@cellbio.emory.edu</a> )	Criss	Dept of Cell Biology 544 Whitehead Bldg	727-0444	727-6256
<b>Hepler</b> ( <a href="mailto:jhepler@emory.edu">jhepler@emory.edu</a> )	John	Dept of Pharmacology G205 Biochem Connector	727-3641	727-0365
<b>Herndon</b> ( <a href="mailto:jim@rmy.emory.edu">jim@rmy.emory.edu</a> )	James, G.	Div of Neuroscience, Yerkes 3147 Yerkes	727-7752	727-7845
<b>Hochman</b> ( <a href="mailto:shochman@physio.emory.edu">shochman@physio.emory.edu</a> )	Shawn	Dept. of Physiology 644 Whitehead Bldg.	712-3131	727-2648

<b>Holtzman</b> ( <a href="mailto:sholtzman@pharm.emory.edu">sholtzman@pharm.emory.edu</a> )	Stephen, G.	Dept. of Pharmacology 5013 Rollins Research Ctr.	727-5990	727-0365
<b>Howell</b> ( <a href="mailto:leonard@rmy.emory.edu">leonard@rmy.emory.edu</a> )	Leonard	Div of Neuroscience, Yerkes 2137 Yerkes	727-7786	727-1266
<b>Hu</b> ( <a href="mailto:xhu@bme.emory.edu">xhu@bme.emory.edu</a> )	Xiaoping	Biomedical Engineering 531 Asbury Circle, Annex #N305	712-2615	712-2707
<b>Humphrey</b> ( <a href="mailto:drh@physio.emory.edu">drh@physio.emory.edu</a> )	Donald, R.	Dept. of Physiology 605L Whitehead Bldg.	727-7419	727-2648
<b>Iuvone</b> ( <a href="mailto:miuvone@pharm.emory.edu">miuvone@pharm.emory.edu</a> )	P. Michael	Dept. of Pharmacology 5107 Rollins Research Ctr.	727-5989	727-0365
<b>Jaeger</b> ( <a href="mailto:djaeger@biology.emory.edu">djaeger@biology.emory.edu</a> )	Dieter	Dept of Biology 2129 Rollins Research Ctr.	727-8139	727-2880
<b>Jenkins</b> ( <a href="mailto:ajenki2@emory.edu">ajenki2@emory.edu</a> )	Andrew	Dept of Anesthesiology 1462 Clifton Rd.	727-3910	712-2585
<b>Jin</b> ( <a href="mailto:peng.jin@emory.edu">peng.jin@emory.edu</a> )	Peng	Dept of Genetics #325 Whitehead Bldg.	727-3729	727-3949
<b>Joshi</b> ( <a href="mailto:joshi@cellbio.emory.edu">joshi@cellbio.emory.edu</a> )	Harish	Dept. of Cell Biology 447 Whitehead Bldg.	727-0445	727-6256
<b>Juncos</b> ( <a href="mailto:jjuncos@emory.edu">jjuncos@emory.edu</a> )	Jorge, L.	Dept. of Neurology Wesley Woods, 1841 Clifton	728-4992 728-4952	728-4892
<b>Justice</b> ( <a href="mailto:jjustic@emory.edu">jjustic@emory.edu</a> )	Joseph, B.	Chair, Dept. of Chemistry 324 Chemistry Bldg.	727-6610	727-6586
<b>Kahn</b> ( <a href="mailto:rkahn@emory.edu">rkahn@emory.edu</a> )	Rick	Dept of Biochemistry G218 Rollins RC	727-3561	727-3746
<b>Keilholz</b> ( <a href="mailto:skeilho@emory.edu">skeilho@emory.edu</a> )	Sheila	Biomedical Engineering 2009C WMB	727-2433	727-9873
<b>Kilts</b> ( <a href="mailto:sdpcdk@emory.edu">sdpcdk@emory.edu</a> )	Clinton	Dept of Psychiatry 4000 WMB	727-8262	727-3233
<b>Kimmel</b> ( <a href="mailto:hikimme@rmy.emory.edu">hikimme@rmy.emory.edu</a> )	Heather	Yerkes Nat'l Primate Ctr, NS Division 954 Gatewood Rd.	727-5052	727-3278
<b>Kinkead</b> ( <a href="mailto:bkindea@emory.edu">bkindea@emory.edu</a> )	Becky	Dept of Psychiatry 4109 WMB	727-3719	727-3233
<b>Kuhar</b> ( <a href="mailto:mkuhar@rmy.emory.edu">mkuhar@rmy.emory.edu</a> )	Michael	Chief/Div. Neuroscience Research 357 Yerkes.	727-3278	727-7845
<b>Lah</b> ( <a href="mailto:jlal@emory.edu">jlal@emory.edu</a> )	James, J	Dept of Neurology 505 Whitehead Bldg	727-3509	727-3728
<b>LaPlaca</b> ( <a href="mailto:michelle.laplaca@bme.gatech.edu">michelle.laplaca@bme.gatech.edu</a> )	Michelle	Dept of Biomedical Engineering, GA Tech 315 Ferst Dr. Suite 1121	894-4738	894-4243
<b>Lee</b> ( <a href="mailto:alee@pharm.emory.edu">alee@pharm.emory.edu</a> )	Amy	Dept. of Pharmacology 5123 Rollins Research Ctr.	727-5991	727-0365

<b>Lee</b> ( <a href="mailto:rhlee@bme.gatech.edu">rhlee@bme.gatech.edu</a> )	Robert	Dept of Biomedical Engineering, GA Tech 315 Ferst Dr. Suite 1121	894-4738	894-4243
<b>Levey</b> ( <a href="mailto:alevey@emory.edu">alevey@emory.edu</a> )	Allan	Chair, Dept.of Neurology 6005 WMRB.	727-5006	727-3157
<b>Li</b> ( <a href="mailto:lianli@pharm.emory.edu">lianli@pharm.emory.edu</a> )	Lian	Dept of Pharmacology 5109 Rollins Research Ctr.	727-5987	727-0365
<b>Li</b> ( <a href="mailto:xiaoli@genetics.emory.edu">xiaoli@genetics.emory.edu</a> )	Xiao-Jiang	Dept. of Human Genetics 347 Whitehead Bldg.	727-3290	727-3949
<b>Lin</b> ( <a href="mailto:xlin2@emory.edu">xlin2@emory.edu</a> )	X. Erick	Dept of Otolaryngology 615 Whitehead Bldg, #543	727-3723	727-6256
<b>Liu</b> ( <a href="mailto:Robert.liu@emory.edu">Robert.liu@emory.edu</a> )	<b>Robert</b>	Dept of Biology #2131 Rollins RC	727-5274	727-2880
<b>Luskin</b> ( <a href="mailto:luskin@cellbio.emory.edu">luskin@cellbio.emory.edu</a> )	Marla	Dept. of Cell Biology 546 Whitehead Bldg.	727-6266	727-6256
<b>Maney</b> ( <a href="mailto:dmaney@emory.edu">dmaney@emory.edu</a> )	<b>Donna</b>	Dept of Psychology 205 Psychology	727-7470	727-0372
<b>Mao</b> ( <a href="mailto:zmao@emory.edu">zmao@emory.edu</a> )	<b>Zixu</b>	Dept of Pharmacology #505G Whitehead	727-8581	727-0365
<b>Mayberg</b> <a href="mailto:Helen.mayberg@emory.edu">Helen.mayberg@emory.edu</a>	Helen	Dept of Psychiatry 4000 WMB	727-6740	727-6743
<b>McKeon</b> ( <a href="mailto:mckeon@cellbio.emory.edu">mckeon@cellbio.emory.edu</a> )	Robert	Dept of Cell Biology 405M Whitehead Bldg.	727-6956	727-6256
<b>Miller</b> ( <a href="mailto:amill02@emory.edu">amill02@emory.edu</a> )	Andrew	Dept. of Psychiatry 4103 WMRB	727-8260	727-3233
<b>Miller</b> ( <a href="mailto:gwmille@emory.edu">gwmille@emory.edu</a> )	Gary	Center for Neurodegen. Diseases Dept of Environmental & Occ. Heath 505H Whitehead Bldg.	712-8582	727-3728
<b>Muly</b> ( <a href="mailto:emuly@rmy.emory.edu">emuly@rmy.emory.edu</a> )	Christopher	Dept. of Psychiatry Yerkes Primate Ctr.	727-9603	727-3278
<b>Mustari</b> ( <a href="mailto:mjmustar@rmy.emory.edu">mjmustar@rmy.emory.edu</a> )	Michael	Chief, Visual Sciences 109 Yerkes	727-9194	727-3278
<b>Neill</b> ( <a href="mailto:dneill@emory.edu">dneill@emory.edu</a> )	Darryl, B.	Dept. of Psychology 328 Psychology Bldg.	727-7445	727-0372
<b>Nemeroff</b> ( <a href="mailto:cnemero@emory.edu">cnemero@emory.edu</a> )	Charles	Chair, Dept. of Psychiatry 4115 WMRB	727-8382	727-3233
<b>Nichols</b> ( <a href="mailto:trn@physio.emory.edu">trn@physio.emory.edu</a> )	T. Richard	Dept. of, Physiology 642 Whitehead Bldg.	727-7406	727-2648
<b>Owens</b> ( <a href="mailto:mowens@emory.edu">mowens@emory.edu</a> )	Michael, J.	Dept. of Psychiatry 4005 WMRB	727-4059	727-3233
<b>Papa</b> ( <a href="mailto:spapa@emory.edu">spapa@emory.edu</a> )	<b>Stella</b>	Dept of Neurology/Yerkes Yerkes NS Bldg	727-7795	727-3278

<b>Pardue</b> (mpardue@emory.edu)	<b>Michelle</b>	Dept of Ophthalmology/BME Emory Clinic/ GA Tech	404-321-6111	
<b>Parr</b> (parr@rmy.emory.edu)	<b>Lisa</b>	Yerkes Primate Center Yerkes NS Bldg	727-3653	
<b>Pearce</b> (bpearce@emory.edu)	<b>Brad</b>	Dept of Psychology 532 Kilgo Circle	727-4914	727-3233
<b>Peng</b> jpeng@genetics.emory.edu	<b>Junmin</b>	Dept of Human Genetics 505D Whitehead Research Bldg.	712-8510	727-3949
<b>Potter</b> Steve.potter@bme.gatech.edu	<b>Steve</b>	Dept of Biomedical Engineering, GA Tech 315 Ferst Dr. #1121	385-2989	894-4243
<b>Preuss</b> tpreuss@rmy.emory.edu	<b>Todd</b>	Yerkes/CBN 954 Gatewood	727-8556	727-8070
<b>Prinz</b> Astrid.prinz@emory.edu	<b>Astrid</b>	Dept of Biology 2105 Rollins RC	727-5191	727-2880
<b>Rainnie</b> (drainni@emory.edu)	<b>Donald</b>	Dept. of Psychiatry 4309 WMRB	712-9714	727-3233
<b>Ressler</b> (kressle@emory.edu)	<b>Kerry</b>	Dept. of Psychiatry 1022 Yerkes Primate Ctr.	727-7739	727-8070
<b>Rilling</b> (jrillin@emory.edu)	<b>James</b>	Dept of Anthropology Geosciences 114	727-5881	727-3233
<b>Rodman</b> hrodman@rmy.emory.edu)	<b>Hillary</b>	Dept. of Psychology 323 Psychology Bldg.	727-2391	727-0372
<b>Rye</b> (drye@emory.edu)	<b>David, B.</b>	Dept. of,Neurology 6000 WMRB	727-9825	727-3157 Linda #7-1366
<b>Sanchez</b> (sanchez@rmy.emory.edu)	<b>Mar</b>	Dept of Psychiatry 4000 WMRB	712-2393	727-3233 Lab-7-8257
<b>Sathian</b> (ksathia@emory.edu)	<b>Krish</b>	Dept. of Neurology 6301 WMRB	727-1324	727-8576 727-1366
<b>Scott</b> (johns@cellbio.emory.edu)	<b>John</b>	Dept. of Cell Biology 405N Whitehead Bldg.	727-6247	727-6256
<b>Segal</b> (rsegal@learnlink.emory.edu)	<b>Richard, L.</b>	Dept. of Rehab Medicine 228 Rehab Center	712-5654	727-5895
<b>Smith</b> (yolands@rmy.emory.edu)	<b>Yoland</b>	Div of Neuroscience, Yerkes 353 Yerkes	727-7519	727-3278
<b>Sokoloff</b> (sokoloff@physio.emory.edu)	<b>Alan</b>	Dept. of Physiology 605H Whitehead Bldg.	727-9905	727-2648
<b>Srinivasan</b> Ssrini2@emory.edu	<b>Shanthi</b>	Div of Digestive Diseases, Internal Med 246 Whitehead Bldg.	727-5298	727-5767
<b>Stein</b> dstein04@emory.edu	<b>Donald</b>	Dept of Emergency Med/Psychology 261 A/P Connector.	712-2540 727-4796	712-9704 727-2388

<b>Stokes</b> ( <a href="mailto:dstokes@biology.emory.edu">dstokes@biology.emory.edu</a> )	Darrell, R.	Dept. of, Biology 2127 Rollins Research Ctr.	727-4213	727-2880
<b>Ting</b> ( <a href="mailto:ltting@emory.edu">ltting@emory.edu</a> )	Lena H.	Dept of Biomedical Engineering, GA Tech 315 Ferst Dr., #3306	894-5216	894-4243
<b>Traynelis</b> ( <a href="mailto:straynelis@pharm.emory.edu">straynelis@pharm.emory.edu</a> )	Stephen	Dept. of Pharmacology 5025 Rollins Research Ctr.	727-0357	727-0365
<b>Van Meir</b> ( <a href="mailto:evanmei@emory.edu">evanmei@emory.edu</a> )	Erwin	Dept of Neurosurgery C5078 Winship Cancer Institute	778-5563	778-5550
<b>Wainer</b> ( <a href="mailto:bwainer@emory.edu">bwainer@emory.edu</a> )	Bruce	Dept. of Pathology /Neurology 208 Wesley Woods	728-4888	728-4917
<b>Walker</b> ( <a href="mailto:psyefw@emory.edu">psyefw@emory.edu</a> )	Elaine	Dept. of Psychology 303 Psychology	727-0761	727-0372
<b>Walker</b> ( <a href="mailto:lwalker@rmy.emory.edu">lwalker@rmy.emory.edu</a> )	Larry	Yerkes Nat'l Primate Ctr. 954 Gatewood Rd.	727-7779	727-1266
<b>Wallen</b> ( <a href="mailto:kim@rmy.emory.edu">kim@rmy.emory.edu</a> )	Kim	Dept. of Psychology 306 Psychology Bldg.	727-4125	727-0372
<b>Warren</b> ( <a href="mailto:swarren@emory.edu">swarren@emory.edu</a> )	Steve	Chair, Dept of Human Genetics 300 Whitehead Bldg	727-5979	727-3949
<b>Weinshenker</b> ( <a href="mailto:dweinshenker@genetics.emory.edu">dweinshenker@genetics.emory.edu</a> )	David	Dept of Human Genetics 301 Whitehead Bldg.	727-3106	727-3949
<b>Weiss</b> ( <a href="mailto:jweis01@emory.edu">jweis01@emory.edu</a> )	Jay, M.	Dept. of Psychiatry 510N Emory West	712-9772/1	712-9755
<b>Wenner</b> ( <a href="mailto:pwenner@physio.emory.edu">pwenner@physio.emory.edu</a> )	Peter	Dept of Physiology 645 Whitehead Bldg.	727-1517	727-2648
<b>West</b> ( <a href="mailto:cwest@emory.edu">cwest@emory.edu</a> )	Charles	Dept.of, Psychiatry 504N Emory West	712-9770	712-9755
<b>Wichmann</b> ( <a href="mailto:twichma@emory.edu">twichma@emory.edu</a> )	Thomas	Dept. of Neurology 6109 WMRB	727-3511 778-4957	727-3157 778-3745
<b>Wilson</b> ( <a href="mailto:markw@rmy.emory.edu">markw@rmy.emory.edu</a> )	Mark, E.	Chief, Div of Psychobiology 1024 Yerkes Primate Ctr	727-9058	727-8070/9069
<b>Wolf</b> ( <a href="mailto:swolf@emory.edu">swolf@emory.edu</a> )	Steven, L.	Dept. of Rehab Medicine 212C Rehab Center	712-4801	712-4809
<b>Wright</b> ( <a href="mailto:dwwrigh@emory.edu">dwwrigh@emory.edu</a> )	David	Dept of Emergency Med. 1712 Uppergate Dr, #36	712- 0511	712-9706
<b>Ye</b> ( <a href="mailto:kye@emory.edu">kye@emory.edu</a> )	Kequiang	Dept of Pathology 100 Whitehead Research Bldg	712-2814	727-8538
<b>Young</b> ( <a href="mailto:lyoun03@emory.edu">lyoun03@emory.edu</a> )	Larry	Dept. of Psychiatry, Yerkes 1028 Yerkes	727-8272	727-8070
<b>Zola</b> ( <a href="mailto:szola@rmy.emory.edu">szola@rmy.emory.edu</a> )	Stuart	Director, Yerkes Primate Ctr 1123 Yerkes	727-7707	727-0623

## **A4. Neuroscience Program Administration**

### **NEUROSCIENCE GRADUATE PROGRAM EXECUTIVE COMMITTEE:**

#### **Faculty Members:**

Yoland Smith	Director, Yerkes/Neurology	727-7519
Ronald Calabrese	Director of Graduate Studies, Dept of Biology	727-0319
Larry Young	Director of Graduate Studies, Dept of Psychiatry	727-8272
Shawn Hochman	Dept Physiology, Director of Admissions Committee	712-3131
Gary Bassell	Dept of Cell Biology	627-3772
Elizabeth Buffalo	Dept of Neurology/Yerkes	712-9431
Michael Davis	Dept of Psychiatry	727-3591
Leonard Howell	Dept of Psychiatry, Yerkes NS	727-7786
Dieter Jaeger	Dept of Biology	727-8139
Lian Li	Dept of Pharmacology	727-5987
Zixu Mao	Dept of Pharmacology	712-8581
Mike Mustari	Dept of Neurology/Yerkes	727-9194
Mike Owens	Dept of Psychiatry	727-4059
Steve Potter	Dept of Biomedical Engineering	385-2989
Kerry Ressler	Yerkes, Dept of Psychiatry	727-7739
Krish Sathian	Dept of Neurology	727-1324
David Weinshenker	Dept of Human Genetics	727-3106
Thomas Wichmann	Dept of Neurology	727-3511
Keqiang Ye	Dept of Pathology	712-2814

#### **Student Members**

Daniel Manvich	Yerkes, Neuroscience	727-1737
Brittany Copp	Yerkes, Neuroscience	

Admissions Committee: Shawn Hochman, Director  
Dieter Jaeger, Amy Lee, Thomas Wichmann,  
Larry Young, Mike Kelly & Becky Seaman

Seminar Directors: Intro: Lary Walker & Andrew Jenkins  
Adv: Elizabeth Buffalo, Ping Chen, Astrid Prinz, Ronald Calabrese, Andrew Escayg,

Magniloquence Seminar Coordinators: Kate O'Toole & Jacob Shreckengost

Frontiers Seminar Coordinators: Amanda Caster, Stefanie Ritter, Sonia Hayden, Larry Young

### **GRADUATES IN NEUROSCIENCE (GIN) OFFICERS**

Co-presidents:	Jacob Shreckengost & Kate O'Toole
Secretary	Mike Jutras
Treasurer:	Amy Anderson
Frontiers Coordinators:	Amanda Caster & Stefanie Ritter
Newsletter:	Alex Poplawsky & Amy Mahan

#### **Representatives:**

Executive Committee:	Dan Manvich & Brittany Copp
Admissions Committee:	Mike Kelly & Becky Seaman
Curriculum Committee:	Meera Modi , Sharon Swanger, Stefanie Ritter
DSAC:	Zoe Donaldson
GSC Rep:	Alex Poplawsky, Kalynda Gonzales, Dan Manvich
Atlanta SFN Chapter:	Kim Maguschak & Rebecca Rosen
Webmaster:	Vasiliki Michopoulos, Santiago Archila & Erin Hecht

## A5. 2006-2007 Neuroscience Graduate Student Directory

Updated: August 2007

name underscored denotes MD/PhD Student

<b>Name</b>	<b>E-mail</b>
<b>2007</b>	
Catie Capello	<a href="mailto:ccapell@emory.edu">ccapell@emory.edu</a>
Debra Cooper	<a href="mailto:dcoope8@emory.edu">dcoope8@emory.edu</a>
David Ehrlich	<a href="mailto:dehrli2@emory.edu">dehrli2@emory.edu</a>
Sara Freeman	<a href="mailto:smfreem@emory.edu">smfreem@emory.edu</a>
Lucy Guillory	<a href="mailto:lcguill@emory.edu">lcguill@emory.edu</a>
Eileen Kessler	<a href="mailto:ejkess1@emory.edu">ejkess1@emory.edu</a>
Damon Lamb	<a href="mailto:dlamb@emory.edu">dlamb@emory.edu</a>
<u>Sammy Lee</u>	<a href="mailto:mlee09@learnlink.emory.edu">mlee09@learnlink.emory.edu</a>
Megan Lyle	<a href="mailto:malyle@emory.edu">malyle@emory.edu</a>
Chris Makinson	<a href="mailto:cmakins@emory.edu">cmakins@emory.edu</a>
Lisa Matragrano	<a href="mailto:lmatrag@emory.edu">lmatrag@emory.edu</a>
Jeanne McKeon	<a href="mailto:jmckeon@emory.edu">jmckeon@emory.edu</a>
Rebecca Meyer	<a href="mailto:rcmeyer@emory.edu">rcmeyer@emory.edu</a>
Elaine Pranski	<a href="mailto:epransk@emory.edu">epransk@emory.edu</a>
Steven Ryan	<a href="mailto:sryan2@emory.edu">sryan2@emory.edu</a>
<u>Syed Safavynia</u>	<a href="mailto:ssafavy@learnlink.emory.edu">ssafavy@learnlink.emory.edu</a>
Nikki Sawyer	<a href="mailto:nsawye2@emory.edu">nsawye2@emory.edu</a>
Rachael Stewart	<a href="mailto:restewa@emory.edu">restewa@emory.edu</a>

<b>Name</b>	<b>E-mail</b>	<b>Home Phone</b>	<b>Advisor</b>	<b>Lab Phone</b>
<b>2006</b>				
Amy Anderson	<a href="mailto:akande2@emory.edu">akande2@emory.edu</a>		James Rilling	
Santiago Archila	<a href="mailto:Santiago.archila@emory.edu">Santiago.archila@emory.edu</a>		Shawn Hochman	
Terrell Brotherton	<a href="mailto:tbrothe@emory.edu">tbrothe@emory.edu</a>		Jonathan Glass	
Amanda Caster	<a href="mailto:acaster@emory.edu">acaster@emory.edu</a>		Xiao-Jiang Li	7-3289
Brittany Copp	<a href="mailto:bcopp@emory.edu">bcopp@emory.edu</a>		Mar Sanchez	7-9082/8239
Charity Duran	<a href="mailto:cduran@emory.edu">cduran@emory.edu</a>		Andrew Jenkins	
Alisha Epps	<a href="mailto:sepps@emory.edu">sepps@emory.edu</a>		David Weinshenker	2-8266
Kalynda Gonzales	<a href="mailto:kkgonza@emory.edu">kkgonza@emory.edu</a>		Smith & Wichmann	7-5896/
Erin Hecht	<a href="mailto:ehecht@emory.edu">ehecht@emory.edu</a>		Rilling & Parr	
Amy Mahan	<a href="mailto:amahan@emory.edu">amahan@emory.edu</a>		Kerry Ressler	7-8755
Anlys Olivera	<a href="mailto:aolive3@emory.edu">aolive3@emory.edu</a>		Andrew Miller	7-8261
Mark Porath	<a href="mailto:mporath@emory.edu">mporath@emory.edu</a>		Elizabeth Buffalo	2-9435
Stefanie Ritter	<a href="mailto:slritte@emory.edu">slritte@emory.edu</a>		Randy Hall	

<b>Name</b>	<b>E-mail</b>	<b>Home Phone</b>	<b>Rotation/Advisor</b>	<b>Lab Phone</b>
<b>2005</b>				
Sarah Cork	<a href="mailto:scork@emory.edu">scork@emory.edu</a>	919-824-9959	Erwin VanWeir	
Stacey Dutton	<a href="mailto:sbdutto@emory.edu">sbdutto@emory.edu</a>	410-227-7807	Andrew Escayg	2-2152
Meriem Gaval	<a href="mailto:mgaval@emory.edu">mgaval@emory.edu</a>	850-443-9131	David Weinshenker	2-8266
Michael Kelly	<a href="mailto:ceallaig33@gmail.com">ceallaig33@gmail.com</a>	404-805-5330	Ping Chen	7-1807
Teresa Madsen	<a href="mailto:temeric@emory.edu">temeric@emory.edu</a>	312-350-0151	Don Rainnie	
Daniel Manvich	<a href="mailto:dmanvic@emory.edu">dmanvic@emory.edu</a>	617-642-3802	Leonard Howell	7-7731
Vasiliki Michopoulos	<a href="mailto:vmichop@emory.edu">vmichop@emory.edu</a>	703-732-0566	Mark Wilson	7-3564
Meera Modi	<a href="mailto:mmodi@emory.edu">mmodi@emory.edu</a>	914-714-5617	Larry Young	7-8269
Kevin Murnane	<a href="mailto:amurnan@rmy.emory.edu">amurnan@rmy.emory.edu</a>		Leonard Howell	7-7731
Kate O'Toole	<a href="mailto:otoole_k8@yahoo.com">otoole_k8@yahoo.com</a>	859-380-4464	Andrew Jenkins	
Alexander Poplawsky	<a href="mailto:ajp419@yahoo.com">ajp419@yahoo.com</a>	570-441-3283	Xiaoping Hu	2-2615
Rebecca Seaman	<a href="mailto:rseaman@emory.edu">rseaman@emory.edu</a>	914-475-9840	Ron Calabrese	7-4202
Jacob Shreckengost	<a href="mailto:jshreck@emory.edu">jshreck@emory.edu</a>	330-389-1263	Shawn Hochman	
Sharon Swanger	<a href="mailto:sswange@emory.edu">sswange@emory.edu</a>	609-947-4722	Gary Bassell	7-0668
Ahmad Sylvester	<a href="mailto:asylves@emory.edu">asylves@emory.edu</a>	716-504-7361	Allan Levey	7-8043

<b>Name</b>	<b>E-mail</b>	<b>Home phone</b>	<b>Rotation/Advisor</b>	<b>Lab Phone</b>
<b>2004</b>				
Todd Ahern	<a href="mailto:tahern@learnlink.emory.edu">tahern@learnlink.emory.edu</a>	404-406-6245	Larry Young	7-8269
James Bogenpohl	<a href="mailto:bogie223@yahoo.com">bogie223@yahoo.com</a>	404-320-9559	Yoland Smith	7-5896
Lindsey Fischer	<a href="mailto:lfisch@learnlink.emory.edu">lfisch@learnlink.emory.edu</a>	770-329-7708	Jonathan Glass	7-3517
Eric Heuer	<a href="mailto:ehеuer@emory.edu">ehеuer@emory.edu</a>	404-277-4877	Jocelyne Bachevalier	7-8324
Shareen Iqbal	<a href="mailto:saiqbal@learnlink.emory.edu">saiqbal@learnlink.emory.edu</a>	765-914-5687	Leland Chung	8-3672
Michael Jutras	<a href="mailto:mjutras@emory.edu">mjutras@emory.edu</a>	401-369-1912	Elizabeth Buffalo	2-9435
Jun Liu	<a href="mailto:phipsyche@yahoo.com">phipsyche@yahoo.com</a>	404-550-9705	Anthony Chan	2-8805
Jessica McClung	<a href="mailto:jmccclun@learnlink.emory.edu">jmccclun@learnlink.emory.edu</a>	415-816-2343	Leonard Howell	2-9077
John Rolston	<a href="mailto:jrolston@neuro.gatech.edu">jrolston@neuro.gatech.edu</a>	C404-295-5973	Steve Potter	404-385-4083
Meagan Ward	<a href="mailto:meagan.ward@emory.edu">meagan.ward@emory.edu</a>	404-861-1070	Amy Lee	2-8260
Terrence Wright	<a href="mailto:terrence.m.wright@emory.edu">terrence.m.wright@emory.edu</a>	760-672-9426	Ron Calabrese	7-4202

<b>Name</b>	<b>Email</b>	<b>Home phone</b>	<b>Advisor</b>	<b>Lab phone</b>
<b>2003</b>				
Li-Ting Chien	<a href="mailto:lchien@emory.edu">lchien@emory.edu</a>	770-317-5916	Criss Hartzell	7-6260
Stephen Collins	<a href="mailto:sccolli@emory.edu">sccolli@emory.edu</a>	404-788-2216	Steve Warren	7-0405
Gus Davis	<a href="mailto:adavis2@emory.edu">adavis2@emory.edu</a>	404-218-4516	Allan Levey	2-9924
Zoe Donaldson	<a href="mailto:zdonald@learnlink.emory.edu">zdonald@learnlink.emory.edu</a>	404-550-9908	Larry Young	7-8269
Yair Gozal	<a href="mailto:ymgozal@learnlink.emory.edu">ymgozal@learnlink.emory.edu</a>	404-313-1956	Allan Levey	2-9924
Elyse Katz	<a href="mailto:erkatz@learnlink.emory.edu">erkatz@learnlink.emory.edu</a>	631-495-4326	Joe Cubells	7-2027
Andrea Liatis	<a href="mailto:aliatis@emory.edu">aliatis@emory.edu</a>	404-210-3362	Andrew Miller	7-8261
Kimberly Maguschak	<a href="mailto:kmagusc@emory.edu">kmagusc@emory.edu</a>		Kerry Ressler	7-8755
Elizabeth Martin	<a href="mailto:eimarti@emory.edu">eimarti@emory.edu</a>	404-394-9147	Owens/Nemeroff	7-6120
Rebecca Rosen	<a href="mailto:rfrosen@emory.edu">rfrosen@emory.edu</a>	404-588-9682	Lary Walker	7-7505
Kelly Watts	<a href="mailto:kdwatts@learnlink.emory.edu">kdwatts@learnlink.emory.edu</a>	404-316-3571	Mike Davis	7-3592
Anna Wiste	<a href="mailto:awiste@emory.edu">awiste@emory.edu</a>	in Iceland	Kilts/Thorgeirsson	-----

<b>Name</b>	<b>Email</b>	<b>Home phone</b>	<b>Advisor</b>	<b>Lab phone</b>
<b>2002</b>				
Rayna Bauzo	<a href="mailto:rbauzo@emory.edu">rbauzo@emory.edu</a>	404-636-5931	Leonard Howell	2-9077
Jill Bordelon	<a href="mailto:jbordel@emory.edu">jbordel@emory.edu</a>	404-272-8098	Chris Muly	7-1344
Milos Cekic	<a href="mailto:mcekic@learnlink.emory.edu">mcekic@learnlink.emory.edu</a>	404-798-1078	Don Stein	
Sara Dodson	<a href="mailto:sedodso@emory.edu">sedodso@emory.edu</a>	404-874-2189	Allan Levey	7-8043
Sarah Ewing	<a href="mailto:sbewing@emory.edu">sbewing@emory.edu</a>	404-378-1815	Leonard Howell	2-9077
Anna Goldshmidt	<a href="mailto:agoldsh@emory.edu">agoldsh@emory.edu</a>	404-313-1537	Steve Traynelis	7-1375
Tommy Guillot	<a href="mailto:tguillo@emory.edu">tguillo@emory.edu</a>	404-321-9922	Gary Miller	2-8285
Nicola Hanson	<a href="mailto:nhanson@learnlink.emory.edu">nhanson@learnlink.emory.edu</a>	404-259-7578	Owens/Nemeroff	7-6120
Jaime Hatcher	<a href="mailto:jmhatch@emory.edu">jmhatch@emory.edu</a>	404-229-3310	Gary Miller	2-8285
Lisa Imboden	<a href="mailto:limbode@emory.edu">limbode@emory.edu</a>	404-964-9764	Lian Li	7-5617
Lily Iskhakova	<a href="mailto:liskhak@emory.edu">liskhak@emory.edu</a>	404-634-8126	Yoland Smith	7-5896
Elizabeth Kirk	<a href="mailto:eakirk@emory.edu">eakirk@emory.edu</a>	404-434-9120	Lian Li	7-5617
James Lee	<a href="mailto:jtleee@emory.edu">jtleee@emory.edu</a>	404-320-9559	Lian Li	7-5617
Cliff Michaels	<a href="mailto:ccmicha@emory.edu">ccmicha@emory.edu</a>	404-808-0968	Stephen Holtzmann	7-0356
Heather Ross	<a href="mailto:hross@emory.edu">hross@emory.edu</a>	678-418-3692	Larry Young	7-8269
Kristen Sager	<a href="mailto:klsager@emory.edu">klsager@emory.edu</a>	404-578-8909	Allan Levey	7-8043
Jesse Schank	<a href="mailto:jschank@emory.edu">jschank@emory.edu</a>	404-314-2989	David Weinshenker	2-8266
Kroshona Tabb	<a href="mailto:ktabb@emory.edu">ktabb@emory.edu</a>	404-251-9168	David Weinshenker	2-8266
Suzanne Tydlacka	<a href="mailto:stydlac@emory.edu">stydlac@emory.edu</a>	404-816-4247	Xiao-Jiang Li	7-3289
Brandi Whatley	<a href="mailto:bwhatle@emory.edu">bwhatle@emory.edu</a>	770-934-7931	Lian Li	7-5617
Jennifer Wilhelm	<a href="mailto:jlcaldw@emory.edu">jlcaldw@emory.edu</a>	404-964-6747	Peter Wenner	7-1518

<b>Name</b>	<b>Email</b>	<b>Home phone</b>	<b>Advisor</b>	<b>Lab phone</b>
<b>2001</b>				
Sara Giordano	<a href="mailto:sgiorda@emory.edu">sgiorda@emory.edu</a>	770-572-5680	Rick Segal	2-0760/7-2811
Gillian Hue	<a href="mailto:ghue@emory.edu">ghue@emory.edu</a>	404-437-6208	David Rye	7-3305
Lisa Kreiner	<a href="mailto:lahill@emory.edu">lahill@emory.edu</a>	770-447-5563	Amy Lee	2-8260
Adam Orr	<a href="mailto:alorr@emory.edu">alorr@emory.edu</a>	770-262-1057	Xiao-Jiang Li	7-3289

<b>Name</b>	<b>Email</b>	<b>Home phone</b>	<b>Advisor</b>	<b>Lab phone</b>
<b>1999</b>				
Katrin Offe	<a href="mailto:koffe@emory.edu">koffe@emory.edu</a>	404-377-6747	Allan Levey	7-6136
Nathan Schulteiss	<a href="mailto:nschult@emory.edu">nschult@emory.edu</a>	770-936-1424	Dieter Jaeger	7-1320

\*\*\*\*\*

**Frequently Used Numbers:**

Sonia Hayden  
 Program Coordinator:  
[shayden@emory.edu](mailto:shayden@emory.edu)  
 954 Gatewood, Yerkes #4212 NSB  
 #7-3707, fax #7-8070

Dr. Yoland Smith  
 Program Director  
[yolands@rmy.emory.edu](mailto:yolands@rmy.emory.edu)  
 Yerkes Primate Center  
 #7-7519

Dr. Ron Calabrese  
 Director of Graduate Studies, Yrs. 1-2  
[Ronald.Calabrese@emory.edu](mailto:Ronald.Calabrese@emory.edu)  
 Dept of Biology  
 #7-0319

Dr. Larry Young,  
 Director of Graduate Studies Yrs. 3+  
[Lyou03@emory.edu](mailto:Lyou03@emory.edu)  
 Yerkes Primate Center  
 #7-8272

Health Sciences Library: Information: #7-5810 Circulation: #7-5811

**Common Departmental Addresses <http://directory.service.emory.edu/>**

A6.

ROTATION PROPOSAL

*(Must be filled by the Graduate student and approved by the Mentor)*

Student Name: \_\_\_\_\_

Mentor: \_\_\_\_\_

Brief summary of the Project:

How many hours/week should be spent in the lab to achieve these goals: \_\_\_\_\_

Student signature: \_\_\_\_\_

Mentor signature: \_\_\_\_\_

**Please, return this form no later than the beginning of the exam week to:**

**Ronald Calabrese**  
Director of Graduate Studies, Neuroscience Program  
Department of Biology, Rollins RC Building

A7.

**ROTATION EVALUATION**

*(Must be filled by the mentor and discussed with the student)*

Student Name: \_\_\_\_\_ Mentor: \_\_\_\_\_

**GRADE** (Satisfactory/Unsatisfactory): \_\_\_\_\_

How many hours/week did the student spend in the lab: \_\_\_\_\_

Brief summary of the project the student was involved in: (Clearly state what were the goals the student had to achieve in this project):

Impressions of the student's overall performance (Reliability and conscientiousness, Ability to collect and analyze scientific data, Record keeping, Accuracy, Technical skills, comprehension, communication skills, self-reliance and independence, intellectual curiosity-*Emphasize the strengths and weaknesses of the student*)

Achievements (Did the student succeed to achieve the goals set up at the beginning of the rotation? If not, why?)

Student signature: \_\_\_\_\_

Mentor signature: \_\_\_\_\_

**Please, return this form on or before the last day of class, before the exam week to:**

**Ronald Calabrese**

Director of Graduate Studies, Neuroscience Program

Department of Biology, Rollins RC Building

A8.

### GDBBS Mentor Assignment Agreement

This agreement is required to formalize all Mentor assignments in the GDBBS.

Program \_\_\_\_\_

As a GDBBS student, I agree to abide by all the rules and regulations governing my training. I have reviewed and understand these regulations as outlined in the Graduate School Handbook, the GDBBS Policy Manual, and the Program Guidelines.

Student Name \_\_\_\_\_ Date \_\_\_\_\_  
Print or type

\_\_\_\_\_  
Signature

In preparation to mentor a GDBBS student I have reviewed and understand the regulations as outlined in the Graduate School Handbook, the GDBBS Policy Manual, and the Program Guidelines. I agree to abide by these guidelines and to be responsible for the approved stipend and supplements that are required. Stipend levels are set and announced each spring. Supplements are awarded to students who obtain individual fellowship awards paying most, or all, of their stipend, to Division Scholars, and to students holding Woodruff and Diversity Fellowships. The latter two derive their supplement from University funds for the first five years of training.

Mentor Name \_\_\_\_\_ Date \_\_\_\_\_  
Print or type

\_\_\_\_\_  
Signature

**GDBBS Mentor Assignment Agreement**  
**Page -2-**

Student name \_\_\_\_\_  
Print or type

Mentor name \_\_\_\_\_  
Print or type

The Executive Committee of the Program approves of this assignment and certifies that all parties to this agreement are aware of the regulations as outlined in the Graduate School Handbook, the GDBBS Policy Manual (including the GDBBS Banking Regulations), and the Program Guidelines and will work together to provide support and an optimal training relationship.

Program Name \_\_\_\_\_ Date \_\_\_\_\_  
Print or type

\_\_\_\_\_  
Program Director's Signature

As Chair of the Department I approve of this assignment and agree to assure compliance with all regulations as outlined in the Graduate School Handbook, the GDBBS Policy Manual (including the GDBBS Banking Regulations), and the Program Guidelines.

Department Name \_\_\_\_\_ Date \_\_\_\_\_  
Print or type

\_\_\_\_\_  
Departmental Chair Signature

**A9. Dissertation Committee Checklist**

This form outlines the steps you should take to select a Dissertation Committee. When you have completed the form, please return it to the Director of Graduate Studies.

- (1) Select your thesis advisor before examination week of the Fall semester of your second year.
- (2) You and your advisor should select a Dissertation Committee as soon as possible (certainly by the end of the summer semester of your second year). Select five members. Although not required, we encourage you to select one member from another Program or University. The Executive Committee must approve your choices.
- (3) The members of your committee will help you create an original research proposal (Part II of the General Doctoral Exam). The members agree to meet with you as a committee at least once a year to discuss your progress, and to consult with you individually on request.
- (4) The Dissertation Committee administers the final oral defense of your thesis.

You, and your advisor, and the members of your committee should sign and date this form.

-----

Student:

\_\_\_\_\_                      \_\_\_\_\_  
(type or print)                      Signature

Mentor:

\_\_\_\_\_                      \_\_\_\_\_  
(type or print)                      Signature

Neuroscience Program members:

1) \_\_\_\_\_                      \_\_\_\_\_  
2) \_\_\_\_\_                      \_\_\_\_\_  
3) \_\_\_\_\_                      \_\_\_\_\_  
4) \_\_\_\_\_                      \_\_\_\_\_  
5) \_\_\_\_\_                      \_\_\_\_\_  
(type or print)                      Signature

Other members(s):

1) \_\_\_\_\_                      \_\_\_\_\_  
2) \_\_\_\_\_                      \_\_\_\_\_  
(type or print)                      Signature

RETURN TO:                      **Larry Young, Ph.D.**  
    DIRECTOR OF GRADUATE STUDIES  
    Yerkes Primate Center, 954 Gatewood Rd NE  
    Emory University



**To be completed by Chair of dissertation committee (advisor)**

1. Comments on student's progress on dissertation during the last year:
  
  
  
  
  
  
  
  
  
  
2. Comments on student's objectives for the next year:
  
  
  
  
  
  
  
  
  
  
3. Comments on student's timetable for completing dissertation.
  
  
  
  
  
  
  
  
  
  
4. Considering the overall professional development of this student (i.e., presentations at conferences, publishing), is he/she making adequate academic progress? If not, explain why.

\_\_\_\_\_  
Student Signature

Date \_\_\_\_\_

\_\_\_\_\_  
Advisor Signature

Date \_\_\_\_\_

**Committee Member Signatures:**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

RETURN TO:

**Larry Young, Ph.D.**  
DIRECTOR OF GRADUATE STUDIES  
Yerkes Primate Center, 954 Gatewood Rd NE  
Emory University

**A11. Provisional Dissertation Defense Approval Form**

This form must be submitted to the Director of Graduate Studies at least two weeks before the dissertation defense is scheduled.

**NAME**

\_\_\_\_\_

**TITLE OF DISSERTATION**

\_\_\_\_\_

**DATE/PLACE OF DISSERTATION DEFENSE**

\_\_\_\_\_

**TIME OF DISSERTATION DEFENSE** \_\_\_\_\_

Before you can schedule or advertise your final Dissertation Defense you must have a final thesis committee meeting (see section XVI Submission of PhD Dissertation). **The purpose of this form is to verify that all members of your thesis committee have had adequate time to read your dissertation and agree that you have a defensible dissertation and that you may schedule the dissertation defense.**

You, your advisor, and all members of your committee must sign and date this form. When you have completed the form, please return it to the Director of Graduate Studies. Dr. Yoland Smith, Yerkes Primate Center.

Student:

\_\_\_\_\_  
(type or print)

\_\_\_\_\_  
Signature

Mentor:

\_\_\_\_\_  
(type or print)

\_\_\_\_\_  
Signature

Neuroscience Program members:

1) \_\_\_\_\_

\_\_\_\_\_

2) \_\_\_\_\_

\_\_\_\_\_

3) \_\_\_\_\_

\_\_\_\_\_

4) \_\_\_\_\_

\_\_\_\_\_

5) \_\_\_\_\_

\_\_\_\_\_

(type or print)

Signature

Other members(s):

1) \_\_\_\_\_

\_\_\_\_\_

2) \_\_\_\_\_

\_\_\_\_\_

(type or print)

Signature

## A12. REQUIRED COURSE OUTLINES

### A. IBS 555 Principles of Basic Biological & Biomedical Sciences

Day	Date	lecture #	Lecture Topics	Lecturer
Fri	31-Aug	1	Intro to course; expectations; study skills	Falls
		2	Inventing the protein module	Students
Mon	3-Sep	2.1	<b>LABOR DAY -- NO CLASS</b>	
		2.2	<b>Proteins</b>	<b>Kahn (MC) Anderson (co-MC)</b>
Wed	5-Sep	3	1. Secondary and tertiary structures in proteins 2. How do proteins fold? (the very basics of structure ontogeny)	Cheng
		4	R group chemistry: roles in protein structure and function / posttranslational modifications	Cheng
Thurs	6-Sep	5	Proteins as multi module assemblages; Protein modules: structure and binding	Kahn
		6	Protein-protein interactions	Kahn
Fri	7-Sep	7	Antibodies I: antibody ligand interactions, protein binding assays (western, IF, ELISA): experimental design, controls, interpretation, practical applications	Kahn
		8	Antibodies II: continue topics of Antibodies I	Kahn
<b>Mon</b>	10-Sep	9	Protein purification (and bioassays)	Peng
		10	Mass spectroscopy in proteomics; ident. of proteins and their modification	Peng
Wed	12-Sep	11	Intro. to enzymes & Enzyme regulation: allostherism, inhibition, activation	Matsumura
		12	Enzyme kinetics I & Enzyme kinetics II	Matsumura
Thurs	13-Sep	13	Determ of Kd, Km, Ki, Vmax, Bmax, EC50, LD50	Edmondson
		14	Affinity and Specificity	Edmondson
Fri	14-Sep	15	Enzymology in the trenches: Glycolysis as a model pathway	Kahn
		16	Proteolysis: Proteases and the Ub/proteosome system	Anderson

<b>Mon</b>	17-Sep	17	Bioinformatics 1: do-it-yourself session	Anderson Kahn
		18	Bioinformatics 2: using the data to get your PhD	Kahn Anderson
Wed	19-Sep	19	3 D structures: what has a protein structure ever done for me? / what can you learn from them? (case studies) / how read them?	Cheng
		20	Methods for determining 3D structure: What the non-structural biologist should know about crystallographic and NMR methodologies (strengths / weaknesses) when the conversation at a cocktail party turns to protein structural methods	Cheng
Thurs	20-Sep	21	Protein structure-function-reaction mech: Physiology and Disease I	Feyes-Turcu (?)
		22	Protein structure-function-reaction mech: Physiology and Disease II	TBA
Fri	21-Sep		Review (in part through problems/applications?) (8-->9:45 am)	faculty
<b>Mon</b>	24-Sep		Module Exam (8-->9:45 am)	
		22.5	<b>DNA - Replication, Recombination &amp; Repair</b>	<b>Devine (MC)</b>
Wed	26-Sep		First DNA Module Class	
<b>Mon</b>	<b>8-Oct</b>		<b>No class (Fall Break)</b>	
<b>Mon</b>	22-Oct		Module Exam (8-->9:45 am)	
		22.5	<b>RNA - transcription &amp; translation</b>	<b>Reines(MC)</b>
Wed	24-Oct		First RNA Module Class	
<b>Mon</b>	12-Nov		Module Exam (8-->9:45 am)	
		22.5	<b>Lipids, Membranes, Membrane Traffic</b>	<b>Faundez (MC)</b>
Wed	14-Nov		First Lipid Module Class	
<b>Wed</b>	<b>21-Nov</b>		<b>No class (Turkey appreciation day)</b>	
<b>Mon</b>	10-Dec		Module Exam (8-->9:45 am)	

**Course ends 10 Dec at 9:45 am: NO FINAL**

**B. IBS 526 Neuroanatomy and Systems Neuroscience, Fall 2007**

<b>DATE/ROOM</b>	<b>LECTURE</b>	<b>LECTURERS</b>	<b>PAPER DISCUSSION-REVIEWS</b>
	<b>GROSS ANATOMY OF THE CNS</b>	<b>Y. SMITH</b>	
Fr/Aug 31 Yerkes NS	Cellular Organization of the CNS	Smith	Chapter 2 (19-28); Chapter 4 (67-87)
Mo/Sept 03	<b>LABOR DAY-NO CLASS</b>		
Tu/Sept 04 Yerkes NS	Gross Organization of the Mammalian Nervous System I	Preuss	Chapter 7 from Neuroscience-Exploring the Brain, 2 <sup>nd</sup> edition. Bear, Connors and Paradiso
We/Sept 05 Yerkes NS	Gross Organization of the Mammalian Nervous System II	Preuss	Same as for Sept 06
Th/Sept 06 (Med educ. Bldg-XXX)	Lab #1-Gross Anatomy Human Brain	Smith, Preuss, TAs	Lab manual
Fr/Sept 07 (Med educ. Bldg-XXX)	Lab #2-Human Brain Dissection	Smith, Preuss, TAs	Lab manual
Mo/Sept 10 (Med educ. Bldg-XXX)	Lab #3-Comparative Neuroanatomy	Smith and TAs	Lab manual
Tu/Sept 11 (Med educ. Bldg-XXX)	Lab #4-Review	Smith and TAs	Lab manual
	<b>IN VIVO ELECTROPHYSIOLOGY AND BRAIN IMAGING</b>	<b>Y. SMITH</b>	
We/Sept 12 Yerkes NS	Neuro Imaging Techniques	Hu	Instr handouts
Th/Sep 13 Yerkes NS	Neural Coding-In vivo Electrophysiological Techniques	Wichmann	Instr Handouts
	<b>EXPERIMENTAL NEUROANATOMY</b>		
Fr/Sept 14 Yerkes NS	Exp. Neuroanat #1-Tract-Tracing Techniques	Smith	Instr. Handouts
Mo/Sept 17 Yerkes NS	Exp Neuroanat #2-Immuno	Smith	Instr handouts
Tu/Sept 18 Yerkes NS	Exp Neuroanat #3-Immuno EM, Confocal microscopy, In situ hybridization	Smith	Instr handouts
	<b>BRAIN EVOLUTION AND ORGANIZATION OF THE</b>	<b>Y. SMITH</b>	

	<b>CEREBRAL CORTEX</b>		
We/Sept 19 Yerkes NS	Brain evolution-Primates vs non-primates	Preuss	Instr handouts
Th/Sept 20 Yerkes NS	Internal organization of the cerebral cortex	Muly	Instr handouts
Fr/Sept 21 Yerkes NS	Regional and Connectional Organization of the Cerebral Cortex	Preuss	Chapter 19 (349-366)
Mo/Sept 24 Yerkes NS	REVIEW	TAs	
<b>Tu/Sept 25 Yerkes NS</b>	<b>EXAM#1</b>		
	Note that a date outside regular class hours will be set for small groups discussion of a manuscript and experimental neuroanatomy lab session		
	<b>SENSORY SYSTEMS</b>	<b>K. SATHIAN</b>	
We/Sept 26 (10-11:30) Yerkes NS	Somatosensory system Anatomy	K. Sathian	Chapters 21,22
Th/Sep 27 Yerkes NS	Psychophysical principles: Physiology of Touch	K. Sathian	Chapters 21,23
Fr/Sep 28 Yerkes NS	Pain	S. Hochman	Chapter 24
Mo/Oct 01 Yerkes NS	Proprioception	R. Nichols	Chapter 22
Tu/Oct 02 Yerkes NS	Vision I	M. Mustari	Chapters 26,27
We/Oct 03 Yerkes NS	Vision II	M. Mustari	Chapter 28
Th/Oct 04 Yerkes NS	Hearing	S. Hartman	Chapter 30
Fr/Oct 05 DS-100C??	Vestibular System	S. Hartman	Chapter 40
Mo/Oct 08	Fall Break		
Tu/Oct 09	Fall Break		
We/Oct 10 Yerkes NS	Taste/Olfaction	K. Ressler	Chapter 32
Th/Oct 11 Yerkes NS	Systems Plasticity	K. Sathian	Instr handouts
Fr/Oct 12 Yerkes NS	Paper discussion	K. Sathian	
<b>Mo/Oct 15 Yerkes NS</b>	<b>EXAM #2</b>		
	<b>MOTOR SYSTEMS</b>	<b>S HOCHMAN</b>	
Tu/Oct 16 Yerkes NS	Functional Anatomy of the Cerebellum	Y. Smith	Chapter 42
We/Oct 17	Functional Anatomy of the Basal Ganglia	Y. Smith	Chapter 43

Th/Oct 18 Yerkes NS	Functional Anatomy of the Motor Cortices	M. Crutcher	Chapter 33,38
Fr/Oct 19 Yerkes NS	Spinal cord/Descending systems	S. Hochman	Handouts and Chapter 36
Mo/Oct 22 Yerkes NS	Central Pattern Generator	S. Hochman	Handouts and Chapter 37
Tu/Oct 23 DS-100C??	Solns for movements in multidimensional space	L. Ting	Chapters 33,34
We/Oct 24 Yerkes NS	Posture and Balance	L. Ting	Chapters 36,41
Th/Oct 25 Yerkes NS	Oculomotor System	V. Das	Chapter 39
Fr/Oct 26 Yerkes NS	Reach/Grasp	M. Crutcher	Kalaska and Crammond, 1992, Science 255:1517
Mo/Oct 29 Yerkes NS	Motor Learning	M. Crutcher	Instr. handouts
Tu/Oct 30 Yerkes NS	Motor Pathologies	M. Crutcher	Instr. handouts
We/Oct 31 Yerkes NS	Paper critique/discussion	S. Hochman	Manuscript from instructor
<b>Th/Nov 01 Yerkes NS</b>	<b>EXAM #3</b>		
	<b>INTERNAL REGULATION</b>	<b>L. YOUNG</b>	
Fr/Nov 02 Yerkes NS	Anatomy of hypothalamus and pituitary	L. Young	Martin's textbook (Chapter 14)
<b>Mo/Nov 05</b>	<b>SFN meeting</b>	<b>No class</b>	
<b>Tu/Nov 06</b>	<b>SFN meeting</b>	<b>No class</b>	
<b>We/Nov 07</b>	<b>SFN meeting</b>	<b>No class</b>	
Th/Nov 08 Yerkes NS	Regulation of Food Intake	M. Wilson	Chapter 51
Fr/Nov 09 Yerkes NS	Role of Brain Peptides and Social Behavior	L. Young	Nature NS 7: 1048 and Exp Physiol 85S:110
Mo/Nov 12 Yerkes NS	Stress axis	M. Sanchez	Instr handouts Zigmond et al., 1999- "Fundamental Neuroscience" chapter 43, pp 1127-1150 (excluding thyroid axis)
Tu/Nov 13 Yerkes NS	Regulation of Reproduction (confirmed)	M. Wilson	Instr handouts
We/Nov 14 Yerkes Bourne	Sleep and Arousal	A. Freeman	Instr handouts
Th/Nov 15 Yerkes NS	Circadian rhythms	M. Iuvone	Nature rev NS 2003, 4:649
Fr/Nov 16 Yerkes NS	Autonomic Nervous System	F. Gordon	Zigmond et al., 1999-Fund Neurosci textbook, chapter

			38, pp 1027-1048
Mo/Nov 19 Yerkes NS	Enteric Nervous System	S. Srinivasan	Instr handouts
Tu/Nov 20 Yerkes NS	Psychoneuroimmunology	C. Raison	Raison et al., 2002, In Hormones, Brain and Behavior Vol 5, Chapter 90, pp. 209-261
We/ Nov 21 Yerkes NS	Paper discussion	L. Young	Manuscript from instructor
<b>Nov 22-23</b>	<b>THANKSGIVING HOLIDAY</b>	<b>NO CLASS</b>	
	<b>EXAM#4</b> (This exam will be held at a date and time outside regular class hours after Thanksgiving Holiday)	Instructor	
	<b>BEHAV. AND COGNITIVE NEUROSCIENCE</b>	<b>M. DAVIS</b>	
Mo/Nov 26 Yerkes NS	Limbic System Anatomy	T. Preuss	Chapter 16 from Martin's textbook 3 <sup>rd</sup> edition, pp 377-406
Tu/Nov 27 Yerkes NS	Brain systems involved in fear	M. Davis	Davis and Whalen 2001, Mol Psychiatr 6: 13-24. Myers and Davis 2002, Neuron 36: 567-584
We/Nov 28 Yerkes NS	Brain systems involved in stress and anxiety	M. Davis	Davis and Whalem 2001, Mol. Psychiatr 6: 13-24. Myers and Davis 2002, Neuron 36: 567-584
Th/Nov 29 Yerkes NS	Reward Systems in the Brain	D. Neill	Instr. handouts
Fr/Nov 30 Yerkes NS	Drug abuse and dependence	L. Howell	Chapter 51 + Kook et al., 2004, NS Biobehav Rev 27: 739
Mo/Dec 03 Yerkes NS	Anatomy of the hippocampus and related subcortical memory systems	Y. Smith	Chapter 63
Tu/Dec 04 Yerkes NS	Memory formation in humans	J. Bachevalier	Chapter 62
We/Dec 05 Yerkes NS	Role of prefrontal cortex in memory and attention	C. Muly	Instr handouts
Th/Dec 06 Yerkes NS	Introduction to behavioral models	D. Walker	Instr handouts
Fr/Dec 07 Yerkes NS	Consolidation and reconsolidation of memory	D. Walker	Instr handouts
Mo/Dec 10 Yerkes NS	Language and Lateralization	T. Stringer	Chapter 59
Tu/Dec 11 Yerkes NS	Paper critique/Discussion	M. Davis	Manuscript from instructor
<b>Th/Dec 13 DS-100C?</b>	<b>EXAM #5</b>		

**C. IBS 514 Cellular, Molecular and Developmental Neuroscience**

**SPRING 2007 - TUESDAYS and THURSDAYS 10:30 - 12:00 noon**

**Jan, 23, 25, Yerkes NS Bldg Seminar Room**

**Jan 30 (Yerkes, Bourne Seminar Room, main bldg)**

**Feb 1,6,8,13,15, 20, 22, 27 Mar 1,6, 8,13,... 22, 27,29**

**Mar 15, 20 (Yerkes, Bourne Seminar Room, main bldg)**

**Apr 3, 5,10,12, 17, 19, ... 26**

**Apr 24, (Yerkes, Bourne Seminar Room, main bldg)**

**DISCUSSION SECTION: Fridays TBA**

Instructors:

Gary Bassell	Room 405, Whitehead	727- 3772
	<a href="mailto:gary.bassell@emory.edu">gary.bassell@emory.edu</a>	
Ron Calabrese	Room 2113, Rollins	727-0619
	<a href="mailto:rcalabre@biology.emory.edu">rcalabre@biology.emory.edu</a>	
Ping Chen	Room 545 Whitehead	727-1808
	<a href="mailto:pchen2@emory.edu">pchen2@emory.edu</a>	
Art English	Room 405P, Whitehead	727-6250
	<a href="mailto:art@cellbio.emory.edu">art@cellbio.emory.edu</a>	
Randy Hall	Room 5113, Rollins	727-3699
	<a href="mailto:rhall@pharm.emory.edu">rhall@pharm.emory.edu</a>	
Shawn Hochman	644 Whitehead	712-3131
	<a href="mailto:shawn.hochman@emory.edu">shawn.hochman@emory.edu</a>	
Dieter Jaeger	Room 2129 Rollins	727-8139
	<a href="mailto:djaeger@emory.edu">djaeger@emory.edu</a>	
Amy Lee	Room 5123, Rollins	727-5991
	<a href="mailto:alee@pharm.emory.edu">alee@pharm.emory.edu</a>	
Peter Wenner	Room 645 Whitehead	727-1517
	<a href="mailto:pwenner@physio.emory.edu">pwenner@physio.emory.edu</a>	

Teaching Assistants:

Kate O'Toole	1462 Clifton Rd Suite 420,
727-3967	<a href="mailto:kkotool@emory.edu">kkotool@emory.edu</a>
Alex Poplawsky	Emory University - Hospital Annex / 531 Asbury Circle, Suite
	N305; 712-2729 <a href="mailto:apoplaw@emory.edu">apoplaw@emory.edu</a>

**Please e-mail instructors with questions or requests for appointments.**

### Course Lecture List

Day	Date	Lecture #	Topic and Instructor
Thurs	1/18/06	1.	Cell Biology of neurons and glia, I. Ping Chen Chapter 4-5, Chapter 2 (pp19-25) KSJ Read Calabrese handout "Electronics for Neurobiologists 06" in advance of tomorrow's Discussion Section.
Tues	1/23/06	2.	Cell Biology of neurons and glia, II. Ping Chen Chapter 4-5, Chapter 2 (pp19-25) KSJ
Thurs	1/25/06	3.	Cell Biology of neurons and glia, III: neuronal mRNA localization and local protein synthesis. Gary Bassel...Chapter ???? KSJ and ????
Tues	1/30/06	4.	Electronics for neuroscientists. Ionic basis of resting potentials - membranes and ion pumps. Calabrese Chs. 6-7; Appendix A KSJ "Electronics for Neurobiologists 06" <b>Problem Set 1.</b>
Thurs	2/1/06	5.	Ionic basis of resting potentials - passive channels. Calabrese Chs. 6-8 KSJ <b>Problem Set 1.</b>
Tues	2/6/06	6.	Action potentials – voltage-gated channels. Calabrese Chs. 8-9 KSJ <b>Problem Set 2.</b>
Thurs	2/8/06	7.	Action potentials - voltage clamp and patch clamp analysis. Calabrese Chs. 7-8 KSJ <b>Problem Set 2.</b>
Tues	2/13/06	8.	Voltage-gated ion channels I: Molecular diversity and voltage-dependence. Amy Lee, KSJ Ch 5 (106-109; 116-123; 163-169)
Thurs	2/15/06	9.	Synaptic transmission - postsynaptic mechanisms; chemically gated channels. Calabrese Chs. 10-12 KSJ
Tues	2/20/06	10.	Synaptic transmission - presynaptic mechanisms; Ca-mediated release. Amy Lee Ch. 14 (pp 255-258; 274-276) KSJ; Schneggenburger and Neher, Nature 2000, 406:889-893
Thurs	2/22/06	11.	Transmitter release: the vesicle life cycle. Calabrese Chapter 14 (pp262-277; 307-308) KSJ; Rizo, Chen and Arac, Trends Cell Biol. 2006, 16:339-350
Tues	2/27/06	12.	Voltage-gated ion channels II: Modulation. Amy Lee, KSJ Ch 13 (244-248); Brehm and Eckert, Science 1978, 202:1203-1206.
THURS	3/1/06	13.	SYNAPTIC TRANSMISSION - PRESYNAPTIC

MECHANISMS: QUANTAL ANALYSIS. JAEGER CH. 14  
KSJ

The first exam will be held in the evening – Time and Date To be Arranged  
FIRST EXAM - covers lectures 1 through 10 400 points).

- |                      |            |   |
|----------------------|------------|---|
| Tues 3/6/06          | 14.        | Synaptic transmission - postsynaptic mechanisms; inhibition, excitation and synaptic integration. Jaeger Chs. 10-12 KSJ           |
| Thurs 3/8/06         | 15.        | Neurotransmitters and Receptors Hall Ch. 15 KSJ   |
| Tues 3/13/06         |            | <b>SPRING BREAK</b>   |
| Thurs 3/15/06        |            | <b>SPRING BREAK</b>   |
| Tues 3/20/06         | 16.        | Neurotransmitter Receptor Signaling Pathways Hall Chs. 11-12 KSJ  |
| <b>Thurs 3/22/06</b> | <b>17.</b> | <b>Ca<sup>2+</sup> as an intracellular messenger. TBA Berridge et al., 2003, Nature Reviews Molecular Cell Biology 4: 517-529</b> |
| Tues 3/27/06         | 18.        | Neuromodulation I. Hochman  |
| Thurs 3/29/06        | 19.        | Neuromodulation II. Hochman   |

The Second exam will be held in the evening – Time and Date To be Arranged  
SECOND EXAM - covers lectures 11 through 17 300 points).

- |               |     |  |
|---------------|-----|--|
| Tues 4/3/06   | 20. | Sensory Signaling. Hall Ch. 21 KSJ   |
| Thurs 4/5/06  | 21. | Synaptic Plasticity I: Long-Term Potentiation. Hall Ch. 12-13 KSJ                            |
| Tues 4/10/06  | 22. | Synaptic Plasticity II: Comparison between Different Types of Plasticity. Hall Ch. 12-13 KSJ |
| Thurs 4/12/06 | 23. | Development I: Induction and Patterning of the Nervous System. Wenner Ch. 52 KSJ             |
| Tues 4/17/06  | 24. | Development II: Cell generation and selection through cell death. Wenner Ch. 53 KSJ          |
| Thurs 4/19/06 | 25. | Development III: The Guidance of Axons to their Targets. Wenner Ch. 54 KSJ                   |
| Tues 4/24/06  | 26. | Development V: Experience-mediated Synaptic Rearrangement. English Ch.56 KSJ                 |
| Thurs 4/26/06 | 26. | Development V: Experience-mediated Synaptic Rearrangement. English Ch.56 KSJ                 |

TEXTS: Kandel, Schwartz, and Jessell, Elsevier, 2000 (Fourth Edition), Principles of Neural Science--KSJ--Required. The assigned reading in KSJ will be supplemented but should not be overlooked.

DISCUSSION SECTION: **A mandatory 1 hour discussion section will be scheduled.** Discussion sections will cover any problem sets presented and will provide an opportunity for the students to ask questions about course lectures. They will be run by the T.A.

GRADING: 1,100 points can be accumulated during the course. There are two mid-terms (Mid-term 1 is worth 400 points and Mid-term 2 is worth 300) and a final (400 points). The final exam is comprehensive but emphasizes the material in lectures 21-27. Our general policy is not to administer make-up exams unless presented with a university medical excuse. Exams will stress problem solving.

READINGS: Reading in the texts and in the original literature will be assigned by the instructors. Assigned readings will explain and amplify the lecture material, and should not be overlooked.

FINAL EXAM: Will be scheduled for early May, 2006 in the evening. Comprehensive but emphasizes Lectures 18-27 (400 points)

## **D. IBS 551 Techniques in Neuroscience, Fall 2007**

Course Directors: Vallabh Das and Yolanda Smith

This semester long 1 credit hour course is aimed at introducing first-year neuroscience graduate students to the various experimental techniques applied in neuroscience research in the laboratory. The goal is to expose them to these techniques by providing short lectures (~30minutes) from faculty that are experts in particular techniques and follow up with a lab component (~1-1.5 hrs) where they will gain experience by serving or participating in an experiment using that same technique. The course will be built around topics that cover the breadth of neuroscience research and are based on the strength of the research in the neuroscience community at Emory University. Some of the salient points of the course are:-

- The focus of each module would be 1) to provide the students with information on practical aspects of how to apply a particular research technique and 2) to provide insight into applicability to different research areas. The hope is that this course will help students with selecting rotations, reading papers and class work.
- There will be 3 instructors for each topic. After the preliminary lecture part which is given by one of the instructors (to be decided by course directors in consultation with topic instructors), students will be split into 3 groups (approx 5/group) and proceed to the labs where they will be exposed to experiments and equipment.
- In addition, the students will receive a spreadsheet that lists all the different labs in the neuroscience program that are using the techniques covered in the chosen topics. This is to inform students of research going on in other labs other than those chosen for the demonstration.
- This course is going to be setup as satisfactory/unsatisfactory (S/U). However, attendance is compulsory.
- Class will meet 1/week in the Fall semester for the 1<sup>st</sup> year NS students
- Class meeting time for Fall 2007 is Wednesday from 1pm-3pm.

### **Course Topics and Instructors Schedule for Fall 2007**

- BRAIN IMAGING (PET/MRI) - Sept 12
  - Leonard Howell (L)
  - Tim Duong,
  - Xiaoping Hu
- TRANSGENIC APPROACHES - Sept 19
  - David Martin (L)
  - Lary Walker
  - Anthony Chan
- PRIMATE BEHAVIOR - Sept 26
  - Jocelyne Bachevalier (L)

- Lisa Parr
- Jim Herndon
- YERKES FIELD STATION VISIT - Oct 3
- Mark Wilson
- RODENT BEHAVIORAL PARADIGMS - Oct 17
- David Weinshenker (L)
- Gary Miller
- Kerry Ressler
- COMPUTATIONAL NEUROSCIENCE - Oct 24
- Ron Calabrese (L)
- Dieter Jaeger
- Astrid Printz
- IN VIVO SYSTEMS ELECTROPHYSIOLOGY - Oct 31
- Thomas Wichmann (L)
- Elizabeth Buffalo
- Michael Mustari
- IN VITRO CELLULAR ELECTROPHYSIOLOGY - Nov 14
- Shawn Hochmann (L)
- Tig Rainnie
- Amy Lee
- MOLECULAR/CELLULAR NEUROSCIENCE - Nov 21
- Lian Li (L)
- Randy Hall
- Zixu Mao

Note: (L) – Faculty who will give the ½ hr lecture

Class meeting time is Wednesdays from 1pm-3pm

## C. IBS 522 Grant Writing: HYPOTHESIS DESIGN AND SCIENTIFIC WRITING

### **Proposed Schedule – Spring 2008** **IBS 522, Grants Course for the Neurosciences Program**

**Course Title:** Hypothesis Design and Scientific Writing, 2 credits

**Course Director:** Rick Kahn ([rkahn@emory.edu](mailto:rkahn@emory.edu), 7-3561, RRC G-217)

**Course meeting days and times:** TBD

**Students:** Enrollment will be restricted to and required for 2nd year students of the NS Program. Mentors of 2<sup>nd</sup> year students must agree to mentor at least three students in the course or else their students cannot register for the course. Mentoring in this context means they agree to receive and provide detailed critiques of writing from three different students at least twice during the semester.

**Course Objectives:** The course has two principal goals: to teach fundamental skills involved in the formulation of a testable hypothesis and research plan and the writing skills needed to effectively communicate those ideas. Good writing is a critical skill, regardless of future plans or direction.

**Course format:** After a few general lectures and discussions of the mechanics and elements of NIH research grants, time will be devoted to formulating hypotheses and specific aims. Discussions of hypothesis testing and logical construction of proposal arguments will precede the writing of the bulk of the proposals. Each student will then be expected to write a 10 page research grant NRSA proposal containing specific aims, background, preliminary data, and research proposal. The topic of the grant will be the student's thesis project. The emphasis will be on writing and re-writing, with regular writing assignments throughout the semester consisting of sections of the proposal, up to and including early drafts of the entire proposal. At the end of the term there will be a two study sections at which each students' grants will be reviewed and scored, first by NS students and later by NS faculty. Grading for the course will largely be determined by the study section scores and rankings.

**Syllabus:** A 90 minute class will be held once per week. Below is the syllabus that will be used, though because this is the first time the course is being taught in this program, some flexibility should be assumed.

**Week 1 (week of Jan. 21):** Overview of course. General discussion of funding agencies, types of grants, the review process. Summary of class objectives, student responsibilities. Sections of a research grant and how they inter-relate.

**Assignment:** Preparation for presentation of research proposal in class in coming weeks.

**Week 2 (week of Jan. 28):** Scientific writing, hypothesis design and testing and *Specific Aims*.

**Assignment:** Presentation of topic/research projects, with class discussion.

**Week 3 (week of Feb. 4):** *Background section*-purpose, goals. Not a review article. Focus, lead toward the model.

**Assignment:** Presentation of topic/research projects with class discussions (cont.).

**Assignment:** Draft of Specific Aims pages due (1 page limit).

**Week 4 (week of Feb. 11):** *Preliminary data* discussion and scope.

**Assignment:** Second draft of specific aims pages due (still 1 page limit).

**\*Week 5 (week of Feb. 18):** *Research Design* section discussed. Importance model building.

**Assignment:** First draft of Background section due with Specific aims (3<sup>rd</sup> draft).

**Week 6 (week of Feb. 25):** General discussion of Methods sections.

***Assignment:*** Preliminary data and research design section, specific aim #1 due.

***\*Week 7 (week of Mar. 3):*** Miscellaneous class discussion – as needed.

***Assignment:*** First draft of complete proposal due; including Specific Aims (3<sup>rd</sup> draft), Background (2<sup>nd</sup> draft), Preliminary data and research design of specific aim #1 and #2 (2<sup>nd</sup> and 1<sup>st</sup> drafts, respectively).

**March 10-14 = Spring break**

**Week 8 (week of Mar. 17):** Referencing your grant. Other discussions, as needed.

***Assignment:*** Make sure you have the latest version of Endnote loaded in your computer/laptop.

**Week 9 (week of Mar. 24):** Miscellaneous class discussion – as needed.

***Assignment:***

**Week 10 (week of Mar. 31):** Penultimate “draft” of grants due.

***Assignment:*** Four copies of proposals to be turned in for student study section.

**Week 11 (week of Apr. 6):** Grants to be reviewed by senior students in the program, pink sheets to be sent within a few days.

***Assignment:*** Edit applications in response to study section comments.

**Week 12 (week of Apr. 13):** Final grants due.

***Assignment:*** Four copies of proposals to be turned in for faculty study section.

**Week 13 (week of Apr. 20):** Study section.

**Week 14 (week of Apr. 27):** Pink sheets sent asap.

**[Classes end Apr. 28]**

\* Indicates the writing assignment turned in this week will be sent to at least 3 different faculty members and you will receive written critiques of your work within a few days.

**Recommended Book:** "Research Proposals: a guide to success" by Thomas E. Ogden and Israel A. Goldberg, 3<sup>rd</sup> edition, Academic Publishers. This is an excellent work to covers all aspects of NIH grant writing.