NEUROSCIENCE GRADUATE PROGRAM (TRACK 6)

WAKE FOREST UNIVERSITY GRADUATE SCHOOL
OF ARTS AND SCIENCES – BIOMEDICAL SCIENCES

POLICIES AND INFORMATION HANDBOOK FOR GRADUATE STUDENTS
AND FACULTY ADVISORS*

REVISED: July 2013

*Students and their faculty lab rotation and thesis advisors are responsible for familiarity with the policies contained in this document.
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GENERAL INFORMATION

1. **REGISTRATION** - All graduate students will register online through the Graduate School website. Information regarding registration is sent ahead of time to each graduate student.

2. **DRESS CODE** - All Neuroscience Program students are expected to maintain acceptable standards of personal grooming and present a neat, professional appearance at all times. If a student works in a patient care area or interacts with patients, their families or the public, the student must adhere to the Wake Forest Baptist Medical Center Dress Code Policy (http://intranet.wakehealth.edu/Departments/Human-Resources/News/Medical-Center-Dress-Code-Policy-Introduced.htm).

All dress code guidelines are established to meet the following goals:
- Ensure workplace safety
- Promote a professional and positive work environment with limited distractions caused by inappropriate dress

Dress code requirements at the Medical Center can be modified for specific departments and Programs to fit the work environment. Therefore, some general guidelines for graduate students are:

**Clothing**

*In the laboratory:*

Clothing must meet all applicable safety standards, including the standards of infection control, OSHA, Joint Commission and other accrediting or regulatory bodies. This means closed-toe shoes, lab coats and long pants (denim is acceptable) are required. See WFSM’s Environmental Health and Safety Webpage for PPE and Dress Code policies for laboratories (http://www.wakehealth.edu/EHS/).

*In other areas (e.g., classrooms, conference rooms):*

- Clothing must not be dirty.
- Tight, sheer or revealing clothing is not permitted.

Examples of inappropriate dress and/or appearance include, but are not limited to: midriffs, halters or low cut shirts/sweaters showing visible cleavage, spaghetti straps, cutoff t-shirts or t-shirts with derogatory, offensive and/or lewd messages either in words or pictures, low cut, ragged or torn jeans, short shorts, pants or jeans whose waistlines fall at or below the buttocks.

- Jeans and t-shirts that do not fall into the categories described above are acceptable.
- Open-toed shoes are acceptable; however, flip-flops are not acceptable.
- Amount and type of jewelry is not specifically prescribed.
- Covering is not required for tattoos unless the tattoo is offensive in some way

*Scented Products*

Fragrant products, other than minimally scented personal care products, are not permitted.

*Identification*

- Medical Center identification badges should be worn so that the picture and name are clearly
visible. For safety precautions, lanyards must be breakaway or detachable.

3. **SEMINAR PRESENTATIONS and MEETING ROOMS** - All seminar rooms are equipped with necessary equipment to present PowerPoint presentation. These rooms also have wireless access to the Internet. Suite 152 at the Biotech Place (336-331-3178), Room 230 & 233 in the MRI Bldg on the 2nd Floor (6-6890), and the Comprehensive Cancer Center Rooms 1A & 1B (3-6506) can be used for video conferencing.

4. **MAIL** - The Neuroscience Program Office receives mail twice a day (10:30 am and 3:30 pm). It is placed in the designated mailboxes in the neuroscience student room (Hanes 1003). Outgoing mail (pre-stamped, if personal) may be picked up by the mailroom staff in room 1006 at the same time deliveries are made. Stamps may be purchased at the Medical Center Postal Center (G Floor, Watlington Hall). Interdepartmental/WFU mail may be sent through the school mail facilities (use envelopes stored in Program mail room); no postage is necessary. Students working in other departments are responsible for picking up their mail at the above location on a regular basis, although attempts will be made to honor requests to transfer mail to other locations where the student is working.

5. **PAYROLL** - At Orientation you must sign-up for direct deposit for your stipend and you can view your pay stubs on the Human Resource PeopleSoft program - [http://psappprd1.is wfubmc.edu:8001/psp/hrpro/?cmd=login](http://psappprd1.is wfubmc.edu:8001/psp/hrpro/?cmd=login). You will though receive a paper stub for your first stipend payment and these will be distributed by the Graduate School Office.

6. **VACATION** - Since graduate students do not technically accrue vacation time, it is important to get approval for time off from the lab with your advisor. If you are a first-year student and are planning on taking time off between lab rotations (i.e. during the holidays), the Program Director needs to be informed of your plans to be away.

7. **PHOTOCOPIES** - The library will give graduate students 1,000 free photocopies/prints (to be used as they wish) over the duration of their studies. These copies are to be made in the library.

8. **THE GRADUATE STUDENT ASSOCIATION (GSA)** - The main goals of the Graduate Student Association is to provide a means by which graduate students can actively influence and participate in student-related policies and to protect the rights of the graduate students while improving the quality of the environment for the students of Wake Forest University’s Graduate School of Arts and Sciences. The Graduate Student Association also strives to promote fellowship among graduate students and faculty. For more information regarding the GSA, please refer to their web site at [http://graduate.wfu.edu/organizations/index_gsas.html](http://graduate.wfu.edu/organizations/index_gsas.html).

9. **CAMPUS SHUTTLE SERVICES** – Please see [http://graduate.wfu.edu/shuttle.html](http://graduate.wfu.edu/shuttle.html) for details and schedules.

10. **STUDENT DISCOUNTS** – With a valid ID several area business offer discounts to WFU students. For a list of current discounts please see:
    Bowman Gray Campus: [http://infinet.wfubmc.edu/discounts/discounts.htm](http://infinet.wfubmc.edu/discounts/discounts.htm)
11. WAKE FOREST UNIVERSITY ATHLETICS – A student may show up with his/her student ID for admission to any home game with the exception of football and basketball. Student admission tickets to WFU home football and basketball games are limited and will be available via a lottery (information will be provided by the Graduate School). You must present your valid WFUSM student ID when picking up your ticket and/or parking pass. The tickets are general admission within the student section and are strictly for student admission.
GENERAL NEUROSCIENCE GRADUATE STUDENT POLICIES

A. NEW STUDENTS

1. The Director of the Neuroscience Program and members of the Student Advisory Committee will orient the incoming student to our graduate program and will be responsible for monitoring the student's progress and will oversee and advise them in all aspects of coursework and research until such time as a permanent advisor and thesis committee are selected.

2. Once a thesis advisor is selected a thesis committee will be formed which will consist of five members; the student's thesis Ph.D. advisor and four additional members of whom two should be members of the Neuroscience faculty, one of whom will serve as administrative chair. The chair must be from a different department than the thesis advisor. All committee members should be members of the Graduate Faculty. If the Advisor and Committee chair require a committee member who is not a member of the Graduate Faculty or is on faculty at another institution, the advisor must contact the Dean of the Graduate School. Once the committee has been formulated, no substitutions will be allowed except under exceptional circumstances and only then with the approval of the entire Student Evaluation Committee.

The thesis committee is responsible for evaluating the student’s thesis proposal and guiding the student through his/her thesis research. However, the advisor(s) is primarily responsible for the student's guidance and development. This committee, together with the Student Evaluation Committee, will be responsible for evaluation of the student's progress at the end of each year and, based on that evaluation, will determine whether the student should continue in the program. Finally, the thesis committee will also function in determining whether or not a student performs satisfactorily on the final Ph.D. examination (defense).

B. COURSE REGISTRATION

All graduate students will register online through the Graduate School website. Information regarding registration is sent ahead of time to each graduate student.

C. ACADEMIC PERFORMANCE AND STANDARDS

Course Work
All students are expected to maintain an overall B (3.0) average in his/her course work. Any time that a student's average drops below a B (3.0) average, his/her total performance will be reviewed by the Program Director and Student Advisory Committee, and he/she may be subject to dismissal from the Program. A grade of I (Incomplete) may be assigned only when a student fails to complete the work of a course because of illness or some other emergency. If the work required is not completed within thirty days after the student enters for his or her next semester, not counting the summer session, the grade automatically becomes an F. If the student gets a grade lower than a B in a course some form of remediation may be required. Specific remediation will be determined by the course director.

Laboratory Research
Students are expected to devote significant time and effort to the research projects. An “Unsatisfactory” rotation or research grade is deemed by the program as the student demonstrating inadequate progress. The program will request the Dean of the Graduate School place the student on academic probation. The student will meet with the Student Advisory Committee and the Program Director to develop a correction plan. Satisfactory grades in the next research rotation or semester will remove the student from probation. Additional unsatisfactory performance will be grounds for dismissal from the program.

D. TUITION WAIVERS AND STIPEND SUPPORT

Financial support in the form of a stipend and tuition waiver requires an overall B average, satisfactory progress in the research laboratory and meeting all necessary program requirements. After the first year, the source of stipend support will be from individual investigator research grants, training grants, student pre-doctoral NRSA or in extreme circumstances the Graduate School. Students are highly encouraged to pursue their thesis research in a laboratory where stipend support is available. If a student insists on working with an advisor who does not have funds for the student’s stipend support, the Program cannot guarantee stipend support, and the student must obtain approval from both the Program Director and the Student Advisory Committee.

E. STUDENT ADVISORY COMMITTEE

This committee monitors the progress of all first-year students via regular meetings at the end of each semester to discuss course grades, research rotations, and plans for thesis research. This committee must approve labs chosen for rotations and thesis research and makes decisions regarding dismissal from the program. This committee will serve as the advisory committee for all students until a thesis committee is formed. After a thesis committee is formed, The Student Advisory Committee monitors yearly all student progress. The Committee is also available for ad hoc meetings whenever the need arises. It also serves the role of a confidential student advocacy group for negotiating problems that may occur between students and faculty and for counsel and advice regarding personal problems of students that may impact their training.

The Student Advisory Committee will:
- Help in matching student interests with laboratory rotations
- Help with any difficulties in first year course work
- Ensure academic progress

Scenarios where students might ask to meet with the Student Advisory Committee:
- If you need help connecting with resources or people
- If you have difficulties in course work and need help
- If you have questions or concerns about training
- If you have questions about expectations of mentors and laboratory responsibilities
- Help in choosing a Ph.D. advisor
- Help and advice in formulating a thesis committee
- Reality check
F. STUDENT INVOLVEMENT IN PROGRAM DEVELOPMENT

Student representatives will serve on the Recruitment and Admissions Committee and the Curriculum Committee.

At the end of each course, students must complete the course evaluation. This is an opportunity for the students to provide constructive comments for modifications of the course. The Program Director, Course Director and Participating Faculty will review completed course evaluations.

BRAIN AWARENESS COMMITTEE

This committee is composed of 16 of our advanced PhD students and a faculty representative. This group plans and administers outreach programs to local public schools, the community and local colleges during the SFN Brain Awareness Week in March, and throughout the year as services are requested. Most of the advanced neuroscience students (3rd and 4th year) spearhead activities involving lectures, workshops and demonstrations. This provides them with the opportunity to integrate research, teaching and community service. Student participation on this committee is voluntary.

G. STUDENT PARTICIPATION IN PROGRAM ACTIVITIES

In addition to program curriculum requirements, all Neuroscience students are expected to participate in activities such as student recruitment, meeting with visiting faculty and seminar speakers, Neuroscience Research Day, and maintaining the cleanliness of Room 1002 after student lunches and tutorials. Advanced students may be excused from these activities if a written excuse is submitted by the student’s mentor to the Program Director in advance of the required activity.

H. POLICY FOR OWNERSHIP AND USE OF LAB NOTES, PROTOCOLS, RAW DATA, ETC. RESULTING FROM RESEARCH CONDUCTED WHILE IN THE NEUROSCIENCE PROGRAM

All data generated by students in the Neuroscience Program during the course of research projects conducted by them in labs under the supervision of faculty advisors are the property of those labs. Copies of this material can be made and retained by the students, but the original material must remain in the faculty advisor’s laboratory. Manuscripts resulting from this research, whether prepared by the student or advisor, will include the student as author.

The Neuroscience Program should always appear in your address on all publications and abstracts you author/co-author.
CURRICULUM OF THE NEUROSCIENCE PROGRAM (effective for all students entering Fall 2013 and beyond)

Although students can select a curriculum that relates specifically to their educational needs, all students are required to take a series of courses that comprise a core curriculum that provides a strong foundation of training in Neuroscience. These courses, which are listed below in the sequence in which they are to be taken, should be completed prior to taking the preliminary examination. In addition to these core courses, there are a variety of other neuroscience or neuroscience-related courses available to students in the Program, and these are listed in the Bulletin of the Graduate School. Tutorials in Neuroscience (NEUR 705 and 706) is a required course for all first and second year Neuroscience students; however, all students are strongly encouraged to attend. Seminars in Neuroscience (NEUR 703 and 704), Research (NEUR 707 and 708) as well as a Journal Club of the student’s choice are required courses for all graduate students in each semester of their graduate career.

YEAR 1
Credit hours in parenthesis.

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<th>Fall Semester</th>
<th>Introduction to Neuroscience I – 701 (5)</th>
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<td>Seminars in Neuroscience – 703 (1)</td>
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<td>Tutorial in Neuroscience – 705 (0)</td>
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<td>Spring Semester</td>
<td>Introduction to Neuroscience II – 702 (5)</td>
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<td>Intro to Professional Development – GRAD 701 (0)</td>
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<td>Summer Semester</td>
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*A statistics course must be taken by all students during the first OR second semester of their first year. The specific course will be determined depending on the student’s previous experience (e.g., IPP 741 or CPTS 730).

**Each summer, first year students are required to attend the Tutorials and to present a seminar on research conducted during lab rotations. However, all students are strongly encouraged to attend in order to provide support to first year students.
| Fall Semester | Intro to Clinical Neuroscience – 771 (3)  
|               | Tutorial in Neuroscience – 705 (0)  
|               | Seminars in Neuroscience – 703 (1)  
|               | Scientific Outreach – GRAD 709 (1)  
|               | Directed Journal Club of Choice (1)  
|               | Elective Course (3)  
|               | Research – 707  
| Spring Semester | Tutorial in Neuroscience – 706 (0)  
|                | Seminars in Neuroscience – 704 (1)  
|                | Scientific Outreach – GRAD 710 (1)  
|                | Directed Journal Club of Choice (1)  
|                | Elective Course (3)  
|                | Research – 708  
| Summer Semester | Summer Tutorial in Neuroscience – 705 (0)  
|                | Research – 707  

| Fall Semester | Seminars in Neuroscience – 703 (1)  
|               | Directed Journal Club of Choice (1)  
|               | Research – 707  
| Spring Semester | Seminars in Neuroscience – 704 (1)  
|                | Research – 708  
|                | Directed Journal Club of Choice (1)  
| Summer Semester | Research – 707  

YEARS 3, 4, 5
COURSE DESCRIPTIONS

Introduction to Neuroscience I and II (NEUR 701, 702)
Introduction Neuroscience I is the first in a required two-course series for first-year neuroscience graduate students covering basic topics in the neurosciences. Neuroscience I is offered only in the fall semester and deals with neuroanatomy (six weeks), cellular and molecular neuroscience (six weeks), and developmental neuroscience (three weeks). Approximately one third of the course includes laboratory work in neuroanatomy.

Introduction to Neuroscience II is the second in the series of required courses for first-year neuroscience graduate students covering basic topics in the neurosciences. Topics covered include: developmental neuroscience (3 weeks), sensory (six weeks) and motor systems (six weeks). Cognitive and computational neuroscience are also covered in the sensory and motor blocks.

Seminars in Neuroscience (NEUR 703, 704)
This seminar series will meet weekly at designated times during the academic year and will involve presentations by: (i) advanced students in the Neuroscience Program (2nd year +); (ii) neuroscience faculty and post-docs; and (iii) visiting neuroscientists. First year students will make research presentations in the summer tutorial. Attendance is required by all students in the Program.

In addition to the requirements regarding summer tutorials and seminars in neuroscience, all except first year students are required to present a poster on their research each year at the annual Neuroscience Research Day that is usually held in the fall shortly after the annual meeting of the Society for Neuroscience.

Neuroscience Tutorial (NEUR 705, 706)
This is a required course of all first and second year students in the program, while third year students and beyond are strongly encouraged to attend. For each tutorial session there will be a faculty and student presenter. The faculty member will discuss his/her research. The student presenter is responsible for introducing the faculty speaker. In the introduction, please be sure to include the following: 1) Program/Center/ Department of the speaker; 2) how long the speaker has been at WFU; 3) where the speaker received his/her Ph.D.; 4) any other information you want to include (in a maximum 3 - 5 minute Intro). Try to make the Intro interesting by including more than just (1) and (2).

In addition to introducing the faculty member, the student will lead the discussion for the assigned journal article. Several weeks before tutorial, the student will meet with the faculty member to select a paper for presentation. All students participating in the tutorial course are required to read and discuss the paper.

Advice for the student presenter:
As you present the journal article, intersperse questions directed at the audience or even at specific students. In a cocaine self-administration paper for example, you might ask why they used a specific schedule of reinforcement. More generally, you can ask the audience to define terms, concepts, etc. used in the paper or after describing how a specific experiment was done, ask the audience what the results were. Finally, ask about conclusions, interpretations, and future directions of the research. The point here is to try to make the whole process more interesting by fostering a lively and engaging discussion of both the paper and of the faculty presentation. Also see the section below (pg. 18) on Journal Club for information on evaluating and presenting an article.
Neuroscience Summer Tutorial (NEUR 705)
This is a required course of all first year students in the program. Other students are not required to attend but are strongly encouraged to. First year students are required to present talks on one of their lab rotation research topics during the summer session. In addition to the seminar, a paper is also required of first year students. This paper should be a 10-page, double-spaced paper. This paper is meant to be an empirical report on research conducted during a rotation and should be in the J.Neuroscience format. If this isn’t possible, then as an alternative the student should write a brief review of the literature related to his/her research. The review should be done in the format used for mini-reviews in Neuron. Finally, if the required paper for the Summer Tutorial is a multi-authored research article, please provide details on your specific role in the research and writing of the paper in a cover letter. Please indicate if the ms has been submitted or is in preparation for submission. Each student should discuss the proposed topic for their paper with the Program Director before starting to work on it. First-year students are allowed to use their final rotation paper as the required summer paper if that paper wasn’t already submitted at the end of the final rotation. The course director (Dr. Constantinidas) will collect student and faculty evaluations and will meet with you in person one week after your presentation to discuss strategies for improving seminar skills.

Scientific Outreach (GRAD 709, 710)
This is a required course for all students in their second year. The course is designed to introduce the students to outreach experiences essential for the training of a successful scientist in today’s biomedical field. The course will provide hands-on opportunities to educate the lay public about scientific concepts and how they can use the information to lead healthier, more informed lives. Students will convey scientific concepts about the importance of scientific research for the advancement of public health.

Journal Clubs
All neuroscience students are required to register for a directed journal club each semester while in graduate school. The journal club readings enhances the student’s appreciation and understanding of a research field.

NEUR 783 is designed for non-traditional journal clubs. Due to the diverse nature of the Neuroscience Program, there are many laboratories that conduct individual journal clubs specifically tailored to their research. These journal clubs may be more beneficial to students than one of the directed journal clubs listed in the Graduate School bulletin. A letter grade indicative of the student’s performance in these non-traditional journal clubs will be provided by the student’s mentor to the Graduate School at the end of each semester.

Evaluating and Presenting a Paper for Journal Club
Here are some general guidelines for evaluating a paper. You may not answer all of these questions in all cases, and other questions may arise specific to the paper you are reading. This is simply to help you all approach a paper for the purpose of evaluation and/or presentation:

Introduction
- Background – consider background both provided by the authors and obtained on your own.
- Did they provide a thorough, relevant, clear and balanced presentation of the background?
- Is there any bias in their presentation of background? If so, is it justified, or is it inappropriate?
- Are the most appropriate references cited? Are there omissions? Is self-citation excessive?
- Did the organization of the introduction lead logically to the question(s) they will address?
- What are those questions, and what are the hypotheses? What is the purpose of the paper?
• Are the questions important and necessary? Does the central purpose of the paper move the field forward? What is the potential impact for health or knowledge? Or is this an incremental advance, with minimal or even trivial extension or replication of previous work?

Methods
• Do they use the most appropriate approaches to address the questions they ask?
• Is the experimental design complete and appropriate to address the questions they ask?
• Are adequate control groups represented? Are all groups necessary? Does every experiment and every treatment within each experiment “fit” with the overall purpose of the study?
• Did they use proper techniques and procedures? Will the results be reliable and valid?
• Are the methods described in sufficient detail, both to judge the quality and validity of the data, and to be replicated by others? Are important details missing? If there is a problem, is it in the science itself, or is it in the presentation of the science?
• Statistics – Are they appropriate to the nature of the data (e.g., parametric vs. non-parametric) and to the experimental design (ANOVA, t-test, correlation, etc.)? Are they described sufficiently to understand how the data were analyzed and interpreted? Do they state how significance was determined? Have post hoc tests been described and applied appropriately?

Results
• For each experiment, and for each figure and results section – what did they find?
• Are the results presented correctly and completely? Is what you see consistent with what they say? Are any important results or analysis left out?
• Are the results clearly and objectively presented, in both the text and the figures? Is there unnecessary redundancy in text and figures? Are all of the figures informative and necessary?
• Do the results answer the questions they asked in the Intro?

Discussion
• Is their interpretation consistent with the results they presented?
• Is the discussion appropriate to the scope of the results, or does it over-reach?
• Is there a good balance between concrete description and speculation?
• Do they fit their findings into a bigger picture? Do they answer the questions asked in the Intro?
• Is the discussion organized, logical, understandable, repetitive, verbose, necessary, relevant?
• Do they address alternative explanations? Discrepancies or inconsistencies in the data? Do they address disagreement, opposing evidence, differing theories or opinions in the literature?

Overall assessment and priority – how important is the paper? What impact will it have on the field? Would you cite it? would you base your own future experiments on these findings?
Fundamentals of Scientific Integrity and Professionalism (GRAD 713-714)
During orientation week students will be introduced to “Fundamentals of Scientific Integrity”. The goal is to provide a framework and overview of scientific professionalism and research integrity. Students will enroll in GRAD 713 for the fall semester and GRAD 714 for the spring semester. This is a required course for all students. Students will use the Problem Based Learning (PBL) method to identify discipline-specific and broad professional norms and obligations for the ethical practice of science. Content will include the norms and principles for the responsible conduct of science such as data acquisition, management, sharing and ownership, publication practices and responsible authorship. Emphasis will be placed on learning the tenets of responsible conduct of research, the current regulatory and legal climate as well as the underlying norms and principles that shaped these concepts. Topics will include the student and advisor relationship, laboratory dynamics, collaborations in science, appropriate handling of data and appropriation of credit, plagiarism, conflicts of interest and financial responsibility. Students will acquire skills to recognize ethical issues in the practice of science, identifying role obligations and develop sound ethical reasoning to address these issues. Attendance is mandatory.

Introduction to Professional Development in Biomedical Sciences (GRAD 701)
In the spring semester of the first year, students will attend GRAD 701 “Introduction to Professional Development” under the direction of Dr. Michael Tytell. This one-credit course consists of four monthly presentations by invited guests who are currently employed in, or have held positions at, organizations other than large, research-oriented, universities. The purpose is to provide practical information about the range of employment opportunities for master’s and Ph.D. graduates.

AUDITING A CLASS
According to the Graduate School Bulletin, an auditor is subject to attendance regulations and to all other requirements of performance established by the instructor except for exams. If you are auditing a class, please make sure you clarify what is expected of you by the individual faculty instructor prior to the start of class. Auditing a class requires registration with the Graduate School and will be documented on the student’s transcript.

GRADING
If a student believes there is an error in the grade they received on an examination, it is the responsibility of the student to discuss the grading with the appropriate faculty lecturer within one week of the examination date. If applicable, the faculty will then advise the Neuroscience Program Office of the change in grade.

REMEDIATION
At the end of the spring semester, first-year Neuroscience students who have not performed well in the Intro course (e.g. final grades of C in one or more sections) may be required to take a comprehensive remediation which may include retaking those sections in which they failed to obtain a grade of B or better. The remediation will encompass the material contained within the learning objectives outlined in the individual blocks of the Introduction to Neuroscience course. The remediation will be administered two weeks after the end of the semester. Alternatively, retaking a course exam or taking a summer reading course may also serve as remediation. The same alternatives may also be required to remediate a second year course in which the final grade was a C or D.
POLICY ON RESEARCH DURING THE FIRST YEAR AND SUBSEQUENT CHOICE OF A Ph.D. ADVISOR/MENTOR

RESEARCH ROTATIONS
During the first year of graduate study, hands-on laboratory research is required of all students in the Neuroscience Program. Each student must spend a minimum of 20-25 hours per week on average (during the school year; full-time (40 hours) during the summer session) in at least 2 laboratories of his or her choice.

As soon as possible after orientation in August, first-year students are expected to contact individual faculty members to discuss research opportunities in their laboratories. To aid in this, you will be provided with a list of faculty (and their research projects) who have indicated an interest in having students participate in 1st year research rotations in this laboratory. Please take the time to talk with several faculty members regarding lab research. They will welcome your interest. Interesting research experiences during your first year can lead to the judicious selection of a faculty advisor for your Ph.D. thesis research. Once a lab has been selected for a research rotation, a Rotation Research Plan Form (p. 38) should be submitted to the Program Director. Each laboratory research rotation should last approximately 3 months. Students will only be permitted to rotate through laboratories that are likely to be able to fund students beginning in year 2. Exceptions may involve a situation where the student undertakes a rotation for the sole purpose of learning a new technique.

During each laboratory research experience, the student is encouraged to complete a specific research project that can form the basis of a published manuscript. Students will be permitted to complete a maximum of three research experiences during their first year. Permission from the Director and the Graduate Advisory Committee is necessary prior to the start of each laboratory research experience. In order to provide a measure of the student’s knowledge of the research area in each laboratory, as well as to provide experience in scientific writing, a paper is required within 14 days of completion of the research project (see page 23 C-1 for details). This paper should be in the form of a manuscript that may be submitted for publication in a peer-reviewed journal. There may be exceptional cases where this requirement can be waived, but this must be jointly approved by the faculty advisor and Program Director. The paper will be evaluated and graded.

Research during the first year is intended to give the student a meaningful research experience involving a specific project in the sponsor’s lab. Accordingly, students are not expected to serve as laboratory technicians performing only routine tasks in the lab. In addition to providing the student with opportunities for participation in neuroscience research in their first year, laboratory research is also intended to provide the student with the information needed to choose an advisor for their Ph.D. thesis research, which should begin in their second year.

Purpose of Lab Rotations
1. To provide the first-year student with the experience of conducting a research project in collaboration with other personnel in the lab.

2. To foster early interactions between the first-year student, faculty, postdoctoral fellows and senior graduate students.

3. To familiarize the student with particular research areas and the associated literature.
4. To teach the student the laboratory techniques and/or conceptual approaches of a specific research area and how it is incorporated into a viable research program.

5. To provide the student with relevant information for selecting a laboratory and advisor for the Ph.D. thesis research.

**Time Frame**

**August - Acclimation period**

Student interviews with participating faculty members as a prerequisite to deciding on research laboratories. During this time students are encouraged to visit laboratories and talk informally with students, postdoctoral fellows, technicians, and junior faculty, as well as faculty members in the laboratory. Students are encouraged to begin their first laboratory rotation by September 1.

**September 1 - Research begins**

**January – Second Rotation begins**

**May-June – Third Rotation (if necessary) begins**

**Length of Research Experience**

Laboratory research during rotations in the first year are intended to be approximately 3 months. Sufficient time should be spent in a laboratory to complete a specific research project. Additional research experiences will be permitted with the permission of the Director and the Student Evaluation Committee if desired by the student.

**Faculty Participation**

Information from participating faculty will be distributed to students during orientation. This will consist of brief descriptions of each faculty’s research projects. However, faculty who do not submit such a description may still welcome you so go talk to them.

**Expectations**

1. During a student’s stay in the laboratory, the student must learn at least one laboratory technique and familiarity with a conceptual approach and literature in a given field. A written report is required to be submitted to the faculty Research Advisor and to the Program Director within two weeks of completion of the rotation*. This report must be written in a scientific style using the format detailed on the website for the journal J.Neurosci for research or Neuron for mini-review articles. If you are uncertain about whether your report should be a research or review type of article, check with the Program Director. The paper should be approximately 10-12 pages (double-spaced) not counting the list of references or illustrations (figures/tables). The rotation paper will be graded on timely completion as well as content. Papers that are late will incur a reduction in letter grade.

The end-of-rotation Evaluation Form (see pp 39-40) must also be completed and turned in to the Program Director at the same time as the paper.
2. The student should read papers relating to the technique(s) and the research area in which they are involved during that rotation.

3. The student is expected to spend a minimum of 25 hours per week working in the lab during the rotation.

4. In the summer of the first year, each student will be required to present a 30-minute seminar on the topic of one or more of the previous lab research rotations.

5. In general, it is expected that the research will be performed at a level of competence comparable to that of any other graduate student in the program (i.e. more advanced students).

6. Before beginning research in a given laboratory, a Research Plan (page 38) must be completed jointly by the student and the sponsor and submitted to the Director of the Program.

*If a student uses their research from the final rotation for their summer seminar presentation then this report can be used for the summer paper requirement and handed in at the end of summer tutorial.

CHOOSING A THESIS RESEARCH ADVISOR AND THESIS COMMITTEE

Although the Graduate School provides stipends for support of graduate students in their first year, support for all subsequent years is generally provided from training grants, research grants or other extramural funds provided by the student's Ph.D. advisor. Accordingly, students are encouraged to attempt to find a lab that is able to support them after the first year. Only in very exceptional situations will a student be permitted to begin their thesis research in a lab that lacks stipend support. First-year students are encouraged to apply for the Graduate Research Fellowship Program (GRFP) offered through the National Science Foundation (information may be found at the NSF web site: www.nsf.gov) upon entering the Neuroscience Program each fall. This is a prestigious program that will help strengthen your resume and prospects for future postdoctoral positions. Please check to see if your intended field of study would meet the eligibility requirements.

The decision about an advisor for the Ph.D. research must be made in consultation with and with the approval with the Program Director and the Student Advisory Committee. No lab will be permitted to have more than three Neuroscience Ph.D. students at any one time. It may be helpful in choosing a lab for Ph.D. work to consult present, as well as former, students from that lab. (Please see page 9 for articles in Science Careers from the journal Science e.g., “To Choose an Advisor, be an Armchair Anthropologist.”).

Once a student has selected a lab and advisor in which to pursue a Ph.D. thesis project, both the student and advisor should read the mentorship information available on the Track 6 website, then they should meet to discuss and agree on a mentoring plan, sign and date the Track 6 Mentorship Form and send a signed copy to Tina Payne within 1 month of joining the lab.

Shortly after choosing a Ph.D. advisor and a thesis topic, four additional committee members should be selected in consultation with the Ph.D. advisor and, if needed, with advice from the Student Evaluation Committee. At least two members of the committee should be from the Neuroscience Program with one who will serve as Administrative Chair of the Committee. The Committee Chair must be from a different
academic department than the advisor. Committee members should be selected based on their expertise in the area of the thesis research. If the advisor suggests inclusion of an external expert who is not a member of the Graduate Faculty or is faculty at another institution, the advisor must communicate to the Dean of the Graduate School, in writing, the qualifications of the external expert. The Dean will make the final decision to include the individual on the thesis committee.

LABORATORY REQUIREMENTS – ADVANCED STUDENTS
All advanced students are expected to be working in their laboratories (40+ hours/week) unless they are in class.

TIPS ON BECOMING A GOOD Ph.D. STUDENT (*Nature* Vol 441; p. 252)
1. Choose a supervisor whose work you admire and who is well supported by grants and departmental infrastructure.
2. Take responsibility for your project.
3. Work hard long days and evenings all week and part of most weekends. If research is your passion this should be easy, and if it isn’t, you are probably in the wrong field. Note who goes home with a full briefcase to work on at the end of the day. This is a cause of success, not a consequence.
4. Take some weekends and holidays off, so you don’t burn out.
5. Read the literature (see suggestions in section F below) in your immediate area, both current and past. You can’t possibly make an original contribution to the literature unless you know what is already there.
6. Plan your days and weeks carefully to dovetail experiments so that you have a minimum amount of downtime.
7. Keep a good lab notebook and keep it current. Write everything you do down, no matter how redundant or useless you think it is. You, and your advisor after you leave, will be most pleased to be able to go back and track down a problem or how to do a procedure.
8. Be creative. Think about what you are doing and why, and look for better ways to go. Don’t see your Ph.D. as just a road map laid out by your supervisor.
9. Develop good writing skills (this is critical); they will make your scientific career immeasurably easier.
10. To be successful, you must be at least four of the following: smart, motivated, creative, hard-working, skillful and lucky. You can’t depend on luck, so you had better focus on the others!

MORE TIPS (*Nature*, Vol. 445; p. 228)
1. Your vacation begins after you defend your thesis.
2. In research, what matters is what is right, and not who is right.
3. In research and other matters, your advisor is always right (most of the time).
4. Act as if your advisor is always right, almost all the time.
5. If you think you are right and you are able to convince your advisor, your advisor will be very happy.
6. Your productivity varies (as effective productive time spent per day).
7. Your productivity also varies as 1/(your delay in analyzing acquired data).
8. Take data today as if you know that your equipment will break tomorrow.
9. You would be very unhappy to lose your data, so make a permanent back-up copy shortly after acquiring them.
10. Your advisor expects your productivity to be low initially (but you could surprise him/her) and then to be above threshold after a year or so.
11. You must become a better expert in your thesis area than your advisor.
12. When you cooperate, your advisor’s blood pressure will go down a bit.
13. When you don’t cooperate, your advisor’s blood pressure either goes up a bit or it goes down to zero.
14. Usually, only when you can publish your results are they good enough to be part of your thesis.
15. The higher the quality, first, and quantity, second, of your publishable work, the better your thesis.
16. Remember, it’s your thesis. You(!) need to do it.
17. Your advisor wants you to become famous, so that he/she can finally become famous.
18. Your advisor wants to write the best letter of recommendation for you that is possible.
19. Whatever is best for you is best for your advisor.
20. Whatever is best for your advisor is best for you.

SUGGESTED JOURNALS THAT SHOULD BE READ ON A REGULAR BASIS

- Science
- Nature
- J. Neuroscience
- Neuron
- Comparative Neurology
- Nature Neuroscience
- Nature Neuroscience Reviews
- Annual Review of Neuroscience

There are, of course, many other journals including some highly specialized ones like Synapse, Spinal Cord, Hippocampus and Cortex and other very general ones such as Brain Research. The object is not to read each issue cover to cover, but to peruse and pick and choose articles that interest you.
If by the end of your first year, you are not as motivated to regularly keep up with the literature as you are to check email, Facebook, Twitter, YouTube, or to watch TV, you need to seriously assess whether you have chosen the wrong career path.

STUDENT EVALUATION
Students will be monitored on a regular basis in order to ensure the following:

1. Students are spending sufficient time working in the lab
   a. First-year students: 25 hours a week minimum during the academic year; 40+ hours a week during the summer session
   b. Advanced students: 40+ hours a week (unless in class)

2. Students are reading background papers related to the techniques and research utilized in the laboratory. Additional reading in areas complimentary to the student’s and laboratory’s interests is strongly encouraged and makes a critical contribution towards establishing research independence.

3. The level of competence of the student is comparable to that of other graduate students and immediately acted upon if any potential problems surface. Unsatisfactory performance in laboratory research is considered a basis for dismissal from the Program. A grade of Satisfactory vs. Unsatisfactory will be provided by the advisor.

4. Within 14 days of completion of a specific research rotation project, first-year students will submit a 10-page manuscript describing the results of the project to the Director of the Neuroscience Program. The manuscript should be written using the format of a peer-reviewed journal (e.g. the Journal of Neuroscience) and should include Title, Background, Methods, Results, Discussion and Reference sections. This requirement is intended to measure the student’s knowledge of the research area and to provide experience in scientific writing.

5. Written Evaluation
   a. A Rotation Evaluation Form must be completed at the end of each rotation by the rotation advisor for first-year students (see page 39) and submitted to the Chairman of the Student Evaluation Committee.
   b. All students will also be evaluated based on their Neuroscience Seminar presentations.
   c. Advanced students who have not yet advanced to candidacy will be required to submit a one-page summary of their research progress (signed by both the student and his/her advisor) in December and June to the Chairman of the Student Evaluation Committee. A current Biosketch should also be included with the research progress report.
   d. Once a student has convened a thesis committee, a semi-annual formal committee report should be forwarded from the Committee Chair to the Chairman of the Student Evaluation Committee. It is the responsibility of the student to ensure this report is
Additionally, the student should also submit an up-to-date copy of their Biosketch to the Chairman of the Student Evaluation Committee.

During the second year, the Program Director, the Student Evaluation Committee and the student's advisory (Ph.D.) committee will meet to evaluate the student's progress and decide whether to recommend that the student remain in the program and prepare to take the preliminary exam. Performance in the core courses, research progress, as well as other factors, will be considered in reaching this decision. A positive decision means that the student is permitted to take the next step in their graduate education, namely taking the preliminary examination.

POLICIES GOVERNING THE SECOND-YEAR PRELIMINARY EXAMINATION

Between the second and third years of graduate study (by Sept. 30th of year three) all students are required to pass a preliminary Ph.D. exam. If a student cannot meet this deadline, they and their mentor must request an extension from the Student Evaluation Committee.

The exam is comprised of three parts:

1) Preparation of a written research proposal: This proposal will be written using a format similar to that used for NIH predoctoral fellowships (http://grants.nih.gov/grants/funding/424/SF424_RR_Guide_Fellowship_VerB.pdf) except that the page limit is longer (10 pages total: 1 page for Specific Aims, up to 9 pages for the Research Strategy). The topic of this proposal will be that of the student's planned Ph.D. research. Once you and your advisor have decided on a project and have a tentative set of specific aims and hypotheses, you should convene a meeting of your dissertation committee to discuss the general framework of your proposal and get their approval to go forward. From that point on, you should prepare the proposal on your own so that the final written document you give to the committee two weeks prior to the exam reflects only your efforts - you are not permitted to discuss or solicit advice or help from other students (or faculty) in preparing the written document. There is ample time in Step 1 for wide-ranging discussions with your advisor or anyone else.

2) Prepare and deliver a 20 to 30-minute oral presentation to the advisory committee of the student's research proposal, after which the student must satisfactorily answer questions related to the content of the proposal.

3) During the question and answer period, the student is expected to be able to answer questions that may be only tangentially related to the topic of the research proposal, but that requires information attained in course work in the core curriculum. For example, in a proposal dealing with long-term potentiation (LTP) in the hippocampus, the student might be asked to address questions about learning mechanisms in invertebrates (e.g., Aplysia) or about general mechanisms of synaptic transmission and neuropharmacology. The oral exam must be scheduled to take place within two weeks after the written proposal is given to the committee.

Although it is, in principle, possible to use successful passage of the Preliminary Exam as completion of the thesis proposal defense, often significant revision, additions or other changes to the proposal are identified during the Preliminary Exam. In that case, a second meeting may be required in order to obtain the
committee’s final approval of the proposal. This meeting should take place within one to two months after the Preliminary Exam.

Once the thesis committee has given final approval of the proposal, the student will have officially advanced to candidacy. Students are also strongly encouraged to submit individual graduate fellowships (e.g. NRSA, NSF) as soon as they and their mentor feel that it is appropriate. It is expected that these applications will also be completed with guidance and input from mentors and graduate faculty.

It should be noted that successfully obtaining independent fellowship support does not replace the Preliminary Exam requirement. It is ultimately the research program outlined in the thesis proposal that must be satisfactorily defended in order to receive committee approval and be officially admitted to candidacy by the Graduate School.

Finally, if the NRSA is successfully approved and funded by NIH, a copy must be sent to the Neuroscience Program office to be placed in the student’s file and made available as a model for students in the program who are planning or preparing their own fellowship proposals.

*Students are responsible for their and their thesis advisors understanding of the above policies regarding the Preliminary Exam.

FAILURE TO ADVANCE TO CANDIDACY
A terminal M.S. degree may be awarded if a Ph.D. student fails to advance to candidacy or, if for other reasons, a student decides to not complete the Ph.D. In either case, this option requires mutual agreement of both student and mentor. Track 6 requirements for the M.S. degree include: (1) maintaining a grade average of B (3.0) in all coursework; (2) completing a minimum of 24 credit hours; (3) submission of a written dissertation to the Dean of the Graduate School at least four weeks prior to the proposed final examination date; (4) once the Graduate School has been informed, the student will have six months to complete all of the requirements for the M.S. degree; (5) acceptance of the written dissertation by the thesis committee must occur at least ten days prior to the proposed final examination date; and (6) the final examination must be passed at least ten days prior to graduation.

DETAILED ADVICE AND GUIDELINES FOR PREPARING THE SECOND-YEAR PRELIMINARY EXAM (ALSO RELEVANT TO THE PH.D. PROPOSAL AND PREDOCTORAL APPLICATIONS)

**The Basic Proposal is Broken Down into Five Broad Areas:**

1. Specific Aims
2. Background and Significance
3. Preliminary Results/Progress Report
4. Research Design and Methods
5. Literature Cited

Each of these components has a very important role in a successful grant. Each will now be described in turn with an eye toward the successful design of each component.
1. **Specific Aims:** This is, in many respects, the most important aspect of a successful grant. It is the section that is first read by most reviewers, and it is also the section that encompasses the entire grant proposal in one page. The specific aims should begin with a brief narrative of no more than three to four sentences that describes the overall goal of the research and the problem to be addressed by the grant proposal. This narrative should serve to provide the reader with the rationale and importance of the basic specific aims. Each specific aim then encompasses a series of experiments designed to answer one or two specific questions. Each specific aim is described in one sentence and is then followed by a brief narrative that should describe the basic approach that will be taken. This is not the place to put specific experiments, but rather to give a broad overview of the approach that will be taken. It is very valuable at this point to use such phrases as "test the hypothesis" or "examine the notion" or "test the role". In this way, the reader gets the feeling that each series of experiments (each specific aim) is designed with a particular outcome in mind.

2. **Background and Significance:** This section places the experimental research in the context of a more global view of a scientific field. For instance, if you've chosen to characterize a specific receptor or enzyme, it is important at this point to establish that the enzyme or receptor is important. In general, references are provided that support the overall idea that is important to characterize this specific area. Do not try to be too comprehensive. Limit the discussion directly to the problem at hand. It is important in the Background and Significance section to point out those areas in which more information is needed. This is particularly true if your proposal will provide some of that necessary information. It will often be valuable to include a summary paragraph at the end of this section that brings all of the general concepts together and points out the need for further investigation. This will then establish an introduction, for the reader, of the experiments proposed in the grant.

3. **Progress Report/Preliminary Studies:** This is an important aspect of most grants, but will not be a required part of the present examination format. The reason for this is obvious - clearly, most students at the end of the second year, when they are supposed to take the exam, will have little, if any, pilot data. If such data are available, however (especially if the student is in their third year), it should be included. In the real world, however, this section is used to inform the reviewer of those experiments that the investigator has already conducted which indicate that he has the ability and facilities to perform experiments that are proposed in the grant. Do not include Progress Report/Preliminary Studies in this mock grant proposal.

4. **Research Design and Methods:** This is the pivotal section in that it details with those experiments and approaches which will be used to answer the questions set forth in the Specific Aims section and Background and Significance section. There are a wide variety of ways in which this can be accomplished and several examples are appended to this document. It is important to accomplish a number of goals in this section. First, the investigator wishes to establish the rationale behind the experiments in each specific aim. Why are they important? Why are they being conducted? The description of the experiment should be detailed enough so that the reviewer can evaluate the potential success of each experiment and the ability of each experiment to answer the fundamental question being posed. The investigator, however, does not need to go into great detail in terms of how the experiments will be done. For instance, it is not important to say that 25µl of homogenate will be
added to 25µl of binding buffer. It is important, however, to describe the tools that will be used. What brain regions will be evaluated, what assay will be used, etc. Wherever possible, the investigator should use well-established procedures with which the investigator has documented experience. If an experiment is not widely utilized or accepted, or if the investigator has had little experience with it, then the investigator should describe it in sufficient detail to allow the reviewers to evaluate its potential for success. Finally, this section should include two sorts of self-assessments. The first is in the form of expected results. When an experiment has been proposed, it is important to point out what the expected findings will be. For instance, if it is proposed to examine the distribution of receptors in various brain regions, the investigator should say something to the effect of "if our hypothesis is correct, we expect to find that the receptor subtypes will distribute in those areas which have previously describe to . . . . . . . . . . . . ". In this way, the reviewer gets an opportunity to see where the investigator is going. In addition, the investigator gets an opportunity to describe his expected findings and then propose additional experiments. Therefore, the investigator might say something to the effect of "should the receptor distribution not follow our expected findings, we will attempt to use a different ligand . . . . . . . ". In this regard, it is often helpful at the end of each specific aim to put a section termed "Outlook and Pitfalls" or "Potential Success and Pitfalls". This brief description should be a paragraph or less and might point out those experiments which could cause problems and how the investigator would proceed should they be encountered. Again, this gives the reviewer an opportunity to see whether or not the investigator has thought the experiments through in a thorough manner. It is also common in this section to suggest specific alternative outcomes to those you predict as most likely, and to briefly provide interpretations of why these alternative outcomes may occur in the context of your proposal. For example, if your proposal predicts that a certain hormone treatment will only affect a specific population of neurons (based on data in the literature), but if you also find other populations that respond, you could suggest the following: ". . . . treatment with exogenous hormone may induce or up-regulate receptor expression in these other cell types." You could then suggest an experiment to directly test that hypothesis.

5. Literature Cited: Finally, all of the literature which has been cited within the text should be listed at the end of the grant in a section called Literature Cited. These references should include authors, year, full titles, journal, and the total pagination for each paper.

A copy of “Greg’s Guide to Taking Prelim Exams” may be obtained in the Neuroscience Program Office. Additionally, copies of neuroscience student’s NRSA grants that were approved and funded by NIH are available as blueprints. Students are also encouraged to use the resources of the Research Support Core of the Office of Research that offers free advice and workshops on grant and manuscript writing. Guidebooks on scientific writing including grant proposals are available in the Neuroscience Office.
GUIDELINES FOR USE OF THE GRADUATE FUND TO SUPPORT TRAVEL AND RESEARCH

A modest Graduate Fund is available to help support graduate training in the Neuroscience Program. These funds can be used to support travel to one scientific meeting per year by a student who is making a presentation of research conducted while in the Neuroscience Program. The amount and number of awards is dependent upon yearly budget allotments. Travel funds (up to $200-300) may be awarded for presentation of a paper or to look for postdoctoral opportunities (for terminal-year students) may be available, provided prior approval is attained from the Program Director. The following guidelines have been established:

A. Support of travel to a scientific meeting from the Neuroscience Program:
   a. Travel funds will be provided to students conducting thesis research. Students are expected to present a paper or look for postdoctoral opportunities and attend scientific sessions while in the meeting city.

   b. Travel funds will be provided to second through fourth year students (who are first author) to attend scientific sessions while in the meeting city (other funds to offset travel costs may be available through the student’s advisor).

   c. As a rule, first-year students are not authors on papers or presenting posters at scientific meetings; therefore travel funds are not provided. However, if first-year students wish to attend the annual Society for Neuroscience meeting, the student registration fee will be paid by the Program.

   d. All travel to meetings or to related academic activities by students in the Neuroscience Program must be approved by the Director of the program even if travel support does not involve program funds. Students should complete a Travel Authorization form and submit it to the Director for approval prior to the trip. Following the trip, a Travel Expense Voucher form must be completed.

B. Guidelines for Graduate Fund Support of Student Research.

Occasionally, a small fund may be available for purchasing supplies to support student research in special cases where no other funds are available. Requests for such funds should be made in a written request to the Director, co-signed by the student and their advisor, detailing the reasons for the request and the specific items to be purchased.
PREPARATION OF THESIS OR DISSERTATION
GUIDELINES FOR INCLUDING MANUSCRIPTS IN THE BODY OF A THESIS OR DISSERTATION

A. The Neuroscience Program has adopted a policy that manuscripts may be included in the body of a thesis or dissertation under the following conditions:

1. The student must have at least one of the manuscripts that is included in the thesis already published, accepted or accepted with revisions. Additional manuscripts which have been submitted can also be included as individual chapters.

2. The student must be first author on all manuscripts included in the thesis or dissertation and must have played the major role in the research and manuscript preparation.

3. The manuscript(s) will contain a footnote indicating that the research was done in partial fulfillment of requirements for the particular degree.

(Example: "This project is taken in part from a dissertation submitted to the Neuroscience Program, Wake Forest University Health Sciences, in partial fulfillment of the requirements for the degree of Doctor of Philosophy.")

B. The format for including manuscripts in the dissertation is similar to the standard dissertation construction with the following exceptions:

1. Preliminaries: (Same as standard thesis format)
   a. Title Page
   b. Preface and Acknowledgments
   c. Table of Contents
   d. List of Tables, Figures, and Illustrations, etc.

2. Text:
   a. Introduction
      • Should provide the usual background and historical material and an overall statement of the thesis or dissertation project.

   b. Major Body of Thesis or Dissertation
      • Should constitute separately referenced chapters consisting of manuscripts and unpublished material.
      • Chapters of unpublished material must conform to the standard thesis or dissertation format and should include Methods, Results and Discussion sections.
      • When one or more manuscripts appear in succession, a short, linkage section shall be placed between them for the purpose of integrating the manuscript material into a logical sequence.
c. Discussion and Summary
   - Should integrate the various aspects of the thesis or dissertation and include the major conclusions of the work as well as a brief sub-section of Future Directions.

d. Referencing
   - The method used for referencing sources within the Introduction and Summary sections should be the one most consistent with the method required within the manuscripts. Either of the following two styles may be used: author(s) name and publication date (Brown or Brown et al., 1981) or consecutive numbering of references (1-3) in the text. Bibliographies must include author(s), year, complete title, journal, inclusive pagination, and should follow the Summary Section.

e. Additional Material
   - Appendices (if any)
   - Brief curriculum vitae (no more than two pages)

C. In all other aspects of thesis or dissertation preparation, the student is expected to follow the current "Instruction for the Preparation of Theses" issued by the Graduate School Office.

D. The student's thesis or dissertation committee has the ultimate responsibility for evaluation and approval of manuscripts to be included in the body of the thesis or dissertation.

E. A completed rough draft should be presented to each committee member before a final version of the dissertation is prepared.

REQUIREMENTS FOR DISSERTATION PROGRAMS AND DISSERTATION SUBMISSION

a. Dissertation programs will no longer be printed. After approval by the Graduate School, copies should be sent electronically to neuroscience graduate faculty.

b. The Graduate School no longer requires a paper copy of the dissertation. The dissertation will be submitted electronically. Students will upload their dissertations online for the submission process through Proquest. Proquest will then feed the electronic copy to the library. The Graduate School will still approve the electronic copy in Proquest as part of the graduate checklist.

*An electronic copy (and original signed coversheet) should still be submitted to the Neuroscience Program office. It is requested that the student have a copy bound and provided to the Neuroscience Program office although this is not a requirement.*
POLICIES GOVERNING THE Ph.D. FINAL EXAMINATION (DEFENSE)

1. Under the supervision of the advisory committee, the candidate prepares a dissertation embodying the results of their research efforts related to their Ph.D. project.

2. Four weeks prior to the time of the final oral exam, the student must present one copy of the dissertation to the Dean of the Graduate School, and distribute copies to the examining committee members. The committee will be polled by the chair of the examining committee at least ten days before the proposed date of the examination to determine the acceptability of the dissertation.

3. The final examination is held no later than ten days before graduation. If the dissertation advisor or other thesis committee members suggest participation must justify the participation of external experts who are not members of the Graduate Faculty on the basis of research, publications and/or professional activities. If the external expert is to be a voting and signing member of the examining committee, the advisor must communicate to the Dean of the Graduate School, in writing, the qualifications of the external expert.

4. It is expected that the student present a public seminar on their thesis research on the same day of, and preceding, the thesis defense (e.g., seminar at 9:00 am with defense following from 10:00 – 12:00 pm)

5. At least four of the five committee members must agree that the student has passed unconditionally. The committee chair will sign the title sheet and the student shall be recommended for award of the degree.

If reservations are expressed by committee members, the chair of the committee shall ensure that the reservations are communicated to the student. The student is responsible for ensuring that the dissertation is modified to meet the committee’s reservations. When the dissertation has been satisfactorily modified, the student passes the examination. The committee members shall sign the title sheet and the student shall be recommended for award of the degree.

If, in the opinion of more than one member of the thesis or dissertation committee, the student has failed the examination, there is no consensus to pass. The chair of the committee shall advise the student that the thesis or dissertation fails to meet the requirements of the Graduate School. The chair shall ensure that the student knows the reason(s) for failure. If the student resubmits or submits a new thesis or dissertation for consideration by the Graduate School, at least two members of the new examining committee for the thesis and at least three members for the dissertation shall be drawn from the original committee. If the modified or new thesis or dissertation fails to meet the requirements of the Graduate School, the student shall be dismissed from the Graduate School.
GRIVANCE PROCEDURES

Academic Grievance Procedure:

1. Initial Response to Perceived Academic Grievance

   (Throughout this document, it is understood that "faculty member" and "student" may refer to more than one person.)

   Situations may arise in which a student believes that he or she has not received fair treatment from a faculty member in an academic matter. In such cases, within two weeks of the student's awareness of the treatment he or she should talk with the faculty member. If the student and faculty member cannot resolve the problem, the student should immediately consult his or her advisor, the Director of the Graduate Program in the involved department, or the Chair of the department in order to initiate the department's internal grievance procedure (procedures may vary from department to department). If a resolution satisfactory to both parties cannot be reached in a reasonable time, which can vary according to the complexity of the matter, the student may choose to initiate the Graduate Student Academic Grievance Procedure. Initiation of the procedure must be no later than three months after failure to achieve resolution within the department. Failure to initiate the procedure within three months forfeits the student's right to file a grievance with the Graduate School.

2. Faculty Liaison Persons

   The student should first contact either of the two graduate School faculty members, one from the Bowman Gray Campus and one from the Reynolda Campus, who serve as liaisons for graduate students wishing to file a grievance. The Faculty Liaison Persons, who serve a three-year term, are appointed by the Dean of the Graduate School from two candidates from each campus nominated by the Graduate Student Association. They do not serve as advocates for the student, but are available to advise the student concerning academic problems and grievances and to help the student initiate and continue with the grievance procedure. At the student's request, a Faculty Liaison Person may be present during any hearings by the Grievance Committee in order to provide advice to and to insure fair treatment of the student. A graduate student on each campus, recommended by the Graduate Student Association, is also appointed by the Graduate Dean to provide advice and to introduce students to the grievance procedure, and students with a grievance may, but need not, consult them. Names, addresses, and phone numbers of both Faculty Liaison Persons and student advisors can be obtained from the Graduate School office on either campus.

3. Written Petition

   After consulting a Faculty Liaison Person, the student should submit to the Dean of the Graduate School a written petition requesting initiation of the Graduate Student Academic Grievance Procedure. The petition must include the name of the faculty member against whom the grievance is filed, the specific charge, information about the grievance, and the action or relief requested by the student. If appropriate at this time, documentary material may be submitted in support of the grievance, although such material may be reserved until requested by the Chair of the Grievance Committee. At the time the grievance is submitted, the Dean of the Graduate School shall confer with the student to ensure that the student has spoken with the faculty member involved, gone through the department grievance procedure, and contacted a Faculty Liaison Person.
4. **Grievance Committee**

Upon receiving a grievance petition, the Dean of the Graduate School shall appoint a five-member Grievance Committee composed as follows: a Chair who is a member of the Graduate Council; two faculty members from the graduate faculty at large; and two graduate students selected from a list provided by the Graduate Student Association. Both the student filing the grievance and the faculty member against whom it is filed shall be informed of the names of all members of the Grievance Committee. In appointing members of the Grievance Committee, the Dean of the Graduate School will ensure that no conflict of interest will occur. A new committee shall be appointed for each grievance.

5. **Grievance Procedure**

The Dean of the Graduate School will forward copies of the grievance petition to the Grievance Committee, the Faculty Liaison Person with whom the student has consulted, and the faculty member against whom the grievance is filed. The faculty member will then have fourteen days to respond in writing to the grievance. This response will be returned to the Dean of the Graduate School, who will forward copies to the Grievance Committee, the Faculty Liaison Person, and the student filing the grievance.

Within fourteen days of receiving the faculty member's response to the grievance, the Chair shall convene the Grievance Committee to review the charges, to determine if more information and documentation are needed, and to plan and schedule the Grievance Hearing. The Hearing shall be scheduled no sooner than fourteen days but no later than twenty-eight days after the initial committee meeting. The Chair of the Grievance Committee shall ask the parties involved to submit to the Graduate School any further documentation. In addition, each party will submit a list of witnesses who will appear at the Hearing in support of their position, with a one-sentence summary of the information each witness will present. All documentation and the list of witnesses must be submitted at least seven school days prior to the scheduled Hearing. After that time, no additional material or witnesses may be introduced or presented, unless of a compelling nature relevant to either the student or faculty member. In such cases the Chair of the Grievance Committee may allow the additional material or witnesses. The Graduate School shall insure that each committee member and both parties involved receive copies of all material and a list of witnesses at least five school days before the scheduled Hearing, and immediately if additional material or witnesses are allowed.

6. **Grievance Hearing**

The Chair shall preside over the Grievance Hearing, and will vote only to break tie votes of the Grievance Committee. All voting shall be done by secret written ballot. All proceedings during the Hearing shall be recorded on equipment provided by the Graduate School. At all times during the Hearing, the student may have the Faculty Liaison Person present, and both parties may be represented by legal counsel or another representative.

The purpose of the Hearing is to obtain information which the Grievance Committee can use to make a final evaluation and recommendation to the Dean of the Graduate School. At all times, the Chair of the Grievance Committee shall maintain a civil, reasonable atmosphere.
The Hearing shall proceed in the following manner. First the student who filed the grievance, or a representative, will be given the opportunity to discuss the grievance and to review the documentation submitted by both parties, including the response by the faculty member to the grievance. The faculty member, or representative, will then have the opportunity to ask questions of the student, after which any or all members of the Grievance Committee may ask questions. The student may then present witnesses who can be asked questions by the faculty member and the Grievance Committee.

When the student has presented all of his or her material and witnesses, the faculty member, or representative, will be given the opportunity to discuss the grievance and to review the documentation submitted by both parties, including the original grievance petition. The student, or representative, may then ask questions, followed by questions from the Grievance Committee. The faculty member may then present witnesses who can be asked questions by the student and the Grievance Committee. Reasonable variations of this general procedure may be allowed by the Chair of the Grievance Committee.

During the Hearing witnesses will be present only while they are giving information to the Hearing and being asked questions. They will wait outside the hearing room until called by the Grievance Committee and leave the Hearing after they have spoken.

If at any time during the Hearing either side, in the opinion of the Chair, in any way violates civil, reasonable conduct, the Chair may recess the Hearing for ten minutes. If such behavior continues, the Chair may postpone the Hearing for a maximum of one week.

After all material and witnesses have been presented by both sides, the faculty member and then the student, or their representatives, may make a concluding summary statement touching on all matters they consider relevant to the grievance as filed. Following the student's summary statement, the Hearing will adjourn and the Grievance Committee shall deliberate.

The Grievance Procedure may be stopped at any time upon request of the student to withdraw the grievance. Once withdrawn, that grievance cannot be reactivated. The grievance procedure may be postponed only if either party has an emergency that prevents their preparing for or appearing at a Hearing. The party with the emergency must notify the Chair of the Grievance Committee with documentation of the nature of the emergency as soon as possible and the Chair will determine if a postponement is justified.

7. Recommendation to the Dean of the Graduate School
   Within three days after completion of the Grievance Hearing, the Grievance Committee will make a recommendation which will be sent in writing to both parties and to the Dean of the Graduate School.

8. Decision by the Dean of the Graduate School
   From the time the recommendation is received by the involved parties and the Dean of the Graduate School, either party will have five days to appeal to the Dean of the Graduate School, in writing, the
recommendation of the Grievance Committee. Within two weeks after receiving the recommendation, the Dean of the Graduate School will make a decision and provide a written explanation of the reasons for the decision to the Chair of the Grievance Committee and to the parties involved. The Dean of the Graduate School will also convey the decision to both the Chair and the Director of the Graduate Program of the department involved. The decision of the Dean of the Graduate School is final.

9. Records
All material related to the Grievance Hearing, including tapes of all sessions, shall be placed in a confidential file in the Graduate School office for two years. After that time, all material except the written decision of the Dean of the Graduate School shall be destroyed.

10. Flow Chart
The following chart summarizes the Graduate Student Academic Grievance Procedure.

```
Student speaks with Faculty Member
↓
Resolution ↓
No Resolution ↓
Student initiates department grievance procedures ↓
Resolution ↓
No Resolution ↓
Student initiates Graduate Student Grievance Procedure ↓
Grievance Hearing ↓
Recommendation to Dean of the Graduate School ↓
Appeal by either party to Dean of the Graduate School ↓
Final decision by Dean of the Graduate School
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Non-academic Grievance Procedure:
Grievances of a non-academic nature, such as discrimination or harassment, should be taken to the Chair or Graduate Program Director (or in the case of Neuroscience, Track 6, the Student Evaluation Committee), to the Dean of the Graduate School, to the Equal Employment Opportunity Office, or to the Office of Human Resources (5th Floor, Plaza I, 716-6123).

HEALTH AND EFFECTIVENESS COUNCIL
The Health and Effectiveness Council (HEC) is a dynamic group of students and faculty dedicated to promoting wellness and providing a bridge to treatment for students that may encounter struggles
throughout their education. The Council works without the involvement of the administration unless a leave of absence from school is necessary. This process is strictly confidential. The HEC can provide confidential assistance and education to students who are struggling with a variety of difficulties which include but are not limited to:

- Substance Abuse
- Eating Disorders
- Depression
- Anxiety
- Learning Disability
- Psychiatric Disorders
- Time Management
- Sleep Disorders

Please contact Dr. Gail Cohen at 716-9661.

**WAKE FOREST UNIVERSITY SUBSTANCE ABUSE POLICY AND PROGRAM**

Information on the Substance Abuse Policy and Program may be obtained from the Neuroscience Program Office.

**DISABILITY PROCEDURES**

Wake Forest University is an equal access institution which admits qualified applicants without regard to disability. When a student with a disability is admitted, the University seeks to accommodate those needs that are determined to be reasonable and that do not compromise the integrity of the curriculum.

**Disability Officers**

**For medical or mobility issues - Bowman Gray Campus**
- Dr. Scott Spillmann
- Office: Employee Health, Meads Hall, Ground Floor
- Phone: 716-4801

**For medical or mobility issues - Reynolda Campus**
- Dr. Cecil Price
- Office: Student Health Service, Lower Level of Reynolds Gymnasium
- Phone: 758-5218

**For learning issues on the Bowman Bray Campus and Reynolda Campus**
- Dr. Van Westervelt
- Office: Learning Assistance Center, Reynolda Hall, Rm 117
- Phone: 758-5929

**Making the disability known**
The student is responsible for notifying the appropriate Graduate School office of any disabilities prior to/or during orientation for which an accommodation is needed.

If a student develops a disability after matriculation for which he/she needs an accommodation, then it will be the responsibility of the graduate student to inform the Graduate School of this fact.

In all cases, a disability notification is used to arrange future accommodations but cannot be used as a basis for retroactively changing academic evaluations or grades. Furthermore, accommodations are made not to waive requirements but to give the student equal opportunity to meet those requirements.

The information given to the disability officer will be treated confidentially and will be shared with university administrators and faculty members only to the extent necessary to reach decisions and take actions on requests for accommodations.

Procedure for handling requests for accommodations
Accommodations for disabilities should be based on recommendations from the appropriate campus disability officer, not program directors or individual faculty.

A student with a disability for which he/she wishes an accommodation should make an appointment with the appropriate campus disability officer as soon as possible. It is assumed that this appointment will be made before the semester begins if at all possible. At least ten working days before this first meeting, the student should send documentation of the disability and a set of specific accommodations requested for the disability. The documentation should follow the guidelines found at the website: http://www.wfu.edu/lac/disability-svcs.html.

Wake Forest University reserves the right to determine the appropriateness of submitted documentation and requests for accommodation on a case by case basis, using the professional judgment of the disability officer. Additional information may be requested to verify the disability and to make a decision on accommodations.

If the disability officer determines that accommodations are appropriate, a letter describing these accommodations will be written. A new letter will be required for each academic year. The student has the responsibility of showing this letter each semester of the academic year to any supervising persons in order to receive the accommodation. The student should be careful to do this over various course, lab assignments, etc.

A supervisor who is shown this letter should discuss the accommodation with the student and make appropriate arrangements. If there are any questions, the supervising person should discuss the accommodation with the appropriate contact person.

Identifying a disability while enrolled
A student who thinks that he/she might have a disability should contact the appropriate campus disability officer. The student may be asked to undergo a formal evaluation for that disability to determine the need for reasonable accommodations. This evaluation is paid for by the student.
For a possible Learning Disability or Attention Deficit Hyperactivity Disorder (ADHD), students on both campuses can receive a screening evaluation at no direct cost to the student. Temporary accommodations may be recommended while this screening process is being made. If this screening evaluation determines that a student may have a disability, then the student will be referred to a provider for a formal evaluation. This formal evaluation will be paid for by the student.

REFER TO WAKE FOREST UNIVERSITY BULLETIN FOR THE GRADUATE SCHOOL OF ARTS AND SCIENCES FOR ADDITIONAL POLICIES AND REQUIREMENTS
Graduate Student Rotation Research Plan Neuroscience Program

Date: ________________________________

Student: ______________________________________________________

Advisor: ______________________________________________________

Project Title: ______________________________________________________

Neuroscience Discipline:
- Molecular; Cellular; Developmental; Sensory; Behavioral/Cognitive; Substance Abuse; Clinical

Project Plan:

________________________________________                                  _____________________

Signature of Advisor                                                                                        Date

________________________________________                                  _____________________

Signature of Student                                                                          Date

First Year Neuroscience Student Laboratory Rotation Evaluation Form
Student:  
Laboratory Advisor:  

Please rank the student in the following categories.  

Note: Scores range from 1-5 with 1 being worst and 5 being best. In order to identify areas of strengths and weaknesses, please assign a score of 3 when the student meets expectations equivalent to the average first year graduate student. Scores of 1 and 2 would then indicate areas of concern. Indicate NA when the area was not applicable OR if you have no basis for evaluating the student in an area (please comment on this).  

Level of technical competence in the laboratory. By the end of the rotation could the student perform routine tasks and experiments independently and correctly?

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Comments:  

Ability to understand the scientific rationale behind experiments.

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Comments:  

Ability to read and evaluate relevant literature.

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Comments:  

Ability to convey information (experimental design, results, conclusions) in oral form.

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Comments:  

Ability to convey information (experimental design, results, conclusions) in written form.

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Comments:  


Ability to interact in laboratory (work with others):

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*Comments:*

Interest in pursuing rotation project (level of enthusiasm for science):

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*Comments:*

The student conscientious about devoting the expected time each week working in the lab.

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*Comments:*

List any potential problems or concerns OR special achievements.

List specific recommendations for improvement in student’s performance.

Approximate time spent in laboratory/week _____________ (hours).

Signature of Advisor: _______________________________  Date:____________________

Signature of Student: _______________________________  Date:____________________
Track 6 Student-Faculty Mentorship Form

My student, ____________________________, and I have read both the NAS mentorship booklet and the WFU Graduate School Statement of Philosophy of the Mentoring Relationship and, using that information, we have developed a plan regarding our mutual expectations involving: (i) time devoted to thesis research vs other contributions to the lab; (ii) frequency of one-on-one meetings; (iii) timely feedback by faculty member on drafts of MSS, thesis proposals and drafts of thesis; (iv) post-doctoral and career planning.

______________________________________________
Faculty

______________________________________________
Student

______________________________________________
Date
Neuroscience Graduate Student Progress Report

Student:
Advisor:

*Please provide detailed answers and adjust space between questions accordingly.*

1. Comment on the student’s progress in pursuing research during the past year:

2. What are the goals for the coming year?

3. Are there any concerns related to the student’s performance of laboratory research?

4. Has the student been admitted to candidacy? If so, when was thesis proposal presented?

5. If the student has not been admitted to candidacy, when does the student plan to take the qualifying exam?

6. Please list the names and departments of thesis committee members.

7. Has the student submitted an NRSA? If so, when? If not, is a submission planned, and when will it be submitted?

8. Will the student be taking courses during the upcoming year? Please list courses.
9. List the accomplishments of the student’s research effort during the past year. Please include any publications, talks, poster presentations at meetings.

10. If possible, please provide a reasonable estimate of the time to completion of the thesis.

11. List any specific recommendations regarding the student’s progress.

12. Are there any recommendations for improvement in the student’s performance?

13. Please provide source of stipend support for the upcoming year.

________________________________________________________________________
Student's Signature                                            Date

________________________________________________________________________
Advisors’s Signature                                            Date
ARTICLES OF INTEREST FOR NAVIGATING GRADUATE SCHOOL AND BEYOND (POSTDOCTORAL AND CAREER PLANNING)

From ScienceCareers (www.sciencecareers.org/career_development)
Submitting Your Best-Possible R01 Application (May 18, 2012)
All in the Details: Careers in Regulatory Science (April 9, 2010)
Transitioning from Researcher to Outreacher (April 9, 2010)
Careers Beyond the Bench (March 5, 2010)
Reaping the Benefits of a Government Job (October 23, 2009)
Funding Your Future: Publish or Perish (September 11, 2009)
Perspective: How to Succeed in Big Science and Still Get Tenure (July 31, 2009)
Independent Postdocs: Early Autonomy (July 31, 2009)
Independent Postdocs: Resources (July 31, 2009)
Business Sense: Starting an Academic Lab (July 17, 2009)
Taken for Granted: An Alternative to the Ph.D. Track (July 13, 2009)
Post-Ph.D. in an Economic Downturn (June 11, 2009)
Pharma Offers Bench-to-Bedside Opportunities (May 29, 2009)
Building a Science Career in the Defense Industry (May 29, 2009)
Academia or Industry? Finding the Right Fit (May 29, 2009)
Piled Higher and Deeper: the Everyday Life of a Graduate Student (March 27, 2009)
The One-minute Talk (March 23, 2009)
Mastering Your Ph.D.: Better Communication With Your Supervisor (June 27, 2008)
Liberal Arts College Faculty: Finding the Sweet Spot (June 27, 2008)
Tooling Up: What Really Matters in a Job Talk (June 20, 2008)
Industrial Postdocs: The Road Less Traveled (June 13, 2008)
Mastering Your Ph.D.: Exploring Nonprofit Organizations (May 2, 2008)
Home Stretch to Graduation (April 18, 2008)
Mastering Your Ph.D.: Goodbye to All That (March 28, 2008)
Mastering Your Ph.D.: Preparing for Your Post-Ph.D. Career (February 22, 2008)
Tooling Up: Put Some Muscle Into Your Marketing Material (February 15, 2008)
No, You’re Not an Imposter (February 15, 2008)
Mastering Your Ph.D.: Dealing With Difficult Colleagues (January 25, 2008)
Mastering Your Ph.D.: Writing Your Doctoral Thesis With Style (December 21, 2007)
To Choose An Advisor, Be an Armchair Anthropologist (July 20, 2007)

From Science:
On Becoming a Scientist (November 13, 2009)
Teaching and Learning Strategies That Work (September 4, 2009)

From Nature:
Enterprising Science (May 10, 2012)
Confessions of a Procrastinator (January 20, 2011)
Where are They Now? (January 6, 2011)
The Best Contacts (October 21, 2010)
The Path Less Travelled (April 8, 2010)
A Foot in the Door (February 4, 2010)
A Bridge to Somewhere (November 12, 2009)