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BEHAVIORAL NEUROSCIENCE PROGRAM

Mission Statement and History of the Program

Mission Statement

Behavioral neuroscience is represented by scientists with interests in the physiological and neural substrates of behavior. The mission of the Behavioral Neuroscience Ph.D. program is to produce outstanding young scientists capable of pursuing independent research careers in the field of behavioral neuroscience by providing graduate course instruction and research training of the highest degree. It is the philosophy of the Behavioral Neuroscience Ph.D. program that this mission is best achieved by having each student obtain a firm academic foundation in both psychology and neuroscience curriculums, and to engage the student in systematic research under the supervision of one of the program faculty. Graduates of the Behavioral Neuroscience Ph.D. program have successfully obtained positions in institutions of higher learning, medical schools, research institutions, and private industry.

Historical and Current Considerations

The field of behavioral neuroscience evolved from several traditional sub-disciplines within psychology (physiological psychology, experimental psychology, sensation and perception, conditioning and learning, motivation, cognition, and regulatory biology) in order to interface with the emerging field of neuroscience. In this manner, the behavioral neuroscientist provides a vital contribution to the field of neuroscience by emphasizing behavioral and functional endpoints in their research.

Research in Behavioral Neuroscience at UAB occurs within an interdisciplinary context thereby providing a rich experience for graduate students. Faculty in the Behavioral Neuroscience Ph.D program hold primary appointments in the Departments of Psychology, Anesthesiology, Ophthalmology, Cell Biology, Neurobiology, Physiology, and the Behavioral Neurobiology Division of Psychiatry. This breadth of perspective is reflected both in the courses offered and the research pursued by Behavioral Neuroscience students. In this spirit, students study core areas of psychology including statistics, behavioral neuroscience, learning, and cognitive neuroscience.

As part of their training, students also gain experience in writing research proposals, manuscripts and in making public presentations.

History of the Program

The Psychology Department initially offered only a Master's degree. In 1976, meetings were held to develop a Ph.D. program in Psychology with two specialties, Behavioral Neuroscience and Medical Psychology. The Behavioral Neuroscience program was viewed as a campus-wide training program involving faculty from the Arts and Sciences and the Medical Center. The Behavioral Neuroscience program was approved by the Board of Regents in 1980 and Dr. David L. Sparks was appointed as the first program director. The Behavioral Neuroscience program was the first degree in any area of Neuroscience offered by UAB. The first class was admitted in 1981. Dr. Joan Lorden assumed directorship of the program in 1981.
Dr. Donald Conner became the first student to graduate from the Behavioral Neuroscience Program in 1988. Dr. Diane C. Tucker was the director of the Behavioral Neuroscience Program from January, 1994 – August, 1998. Dr. Alan Randich assumed the position of director in September, 1998 until November of 2012. Dr. Franklin Amthor has been Interim Director of the program ever since.

Policies and Procedures

Administration

The Director of the Behavioral Neuroscience Specialty has primary responsibility for administering the program in conjunction with the Steering Committee. The director is elected by the Psychology Department faculty and serves a 5-year term. Dr. Franklin Amthor is the current interim director. Terri Roberson is the current administrative assistant.

Behavioral Neuroscience Steering Committee

Policies and procedures are established by the Behavioral Neuroscience Steering Committee. The Steering Committee consists of the primary BN faculty. The Psychology Faculty charges the Steering Committee with management of policies for admissions, governance, and fellowship assignments.

The Steering Committee meets on a regular basis and agenda items can be suggested by any student or faculty member. The Steering Committee reviews graduate student applicants and selects eligible candidates.

Admissions

Admission policies and procedures are overseen by the Behavioral Neuroscience Steering Committee. This committee operates as a subcommittee of the Psychology Department Graduate Admissions Committee. The Behavioral Neuroscience Steering Committee is responsible for recruiting the best-qualified behavioral neuroscience students and for balancing the interests of the behavioral neuroscience specialty with the financial resources available.

This committee meets in the winter to consider admissions. Applicants are not allowed to apply to more than one specialty in the department at a time. For those students admitted into the Behavioral Neuroscience Ph.D. program, a change to another specialty in the department requires re-application to that program. The timeline for application for admission is similar to that in the developmental and medical psychology specialties. The UAB guidelines for admissions to graduate programs are followed. Check the program website for application deadlines.

Support

The Steering Committee oversees all aspects of student support. There are several possible sources of student support including: federal research grants, federal training grants, externally-funded pre-doctoral fellowships, and university fellowships. Students are
encouraged to write grant proposals for externally-funded pre-doctoral fellowships to provide themselves support during their dissertation years. NIH, NSF, and private foundations provide such funds and students in the Behavioral Neuroscience Specialty have successfully competed for such funds.

The Behavioral Neuroscience Specialty typically has funding for one-year fellowships from the UAB Graduate School. New students are often supported by these fellowships during their first year.
Overview of a Student’s Graduate Career

Academic Experience

All students in the Behavioral Neuroscience Program enroll in a series of courses whose intent is to provide the necessary academic background for the student to achieve a successful academic and research career. Coursework is completed by the completion of the Qualifying Examination.

Research Experience

Introduction to Neurobiology (VIS 729)

Prior to starting the first semester of courses, students attend a course held at the Dauphin Island Research Facility. This course introduces the incoming student to many of the basic techniques and issues in the field of neuroscience.

Laboratory Rotations (Year 1)

Laboratory research is a cornerstone of the graduate training program in Behavioral Neuroscience. During the first year, students gain research experience in 2 or 3 laboratories, selecting one laboratory rotation each semester, and one in the summer, or three rotations in the academic year (Sept. – Aug). Laboratories of both primary and associated faculty are open to the students, and students are encouraged to consider a primary faculty laboratory. The laboratory rotations allow students to increase their breadth of experience in behavioral neuroscience before making a commitment to one faculty member's research program.

Based on the laboratory rotations, students select a research mentor at the end of their first year in the program. Through a close collaboration with their mentor, each student develops a systematic line of research which culminates in the doctoral dissertation.

Typical Course of Study

This course of study can vary substantially depending upon previous coursework, the level of entry, and other factors. A full-time student is required to take 24 hours per year and the graduate school recommends a 9, 9, and 6 hour break-down across fall, spring, and summer semesters. Typically, all students take a common first year curriculum.

Year One

Summer Semester Introduction to Neurobiology (VIS 729)

Fall Semester Foundations of Behavioral Neuroscience (PY 753)
Introduction to Statistics (PY 716)
Research Seminar in Behavioral Neuroscience (PY 756)
Pre-doctoral Research (PY 798)
Spring Semester  Advanced Topics in Behavioral Neuroscience (PY 754)
Applied Statistical Methods (PY 717)
Research Seminar in Behavioral Neuroscience (PY 756)
Pre-doctoral Research (PY 798)

Year Two Forward

Each student is required to take four elective courses during their graduate career (prior to completion of the Qualifying Examination) where each course must be at least 3 credit hours. Courses are chosen on the basis of discussion between the student, mentor, and steering committee (if needed). The student and mentor can maintain flexibility in their choice of courses. In addition, students take Pre-doctoral Research (PY 798) in each semester. Students may elect to take courses outside of the Department of Psychology following approval by the mentor and the Director.

Optional Course Project

In some cases, students may have permission to perform a series of experiments in another lab for course credit. This project must (a) be related to the dissertation, (b) approved by the primary mentor, secondary mentor and Director, (c) utilize a technique that is not available in the mentor’s lab, and (d) take sufficient time to account for 3 credit hours. The time requirement for 3 credit hours is approximately 6 hours/week for 15 weeks, totaling 90 hours of work. This work can be done at the mentor and student’s discretion but should be completed within one academic term. At the termination of the project, an evaluation from the primary and secondary mentor is completed which states the outcomes of the project as well as the number of hours completed. A grade will be assigned based on this evaluation. Enrollment into this course should be discussed with the mentor and Director in sufficient time before the start of the term in which the student will be enrolled.

Progress Reports (Years 2-4)

Students must prepare a progress report at the end of each year, beginning in Year 1 that encompasses all aspects of their training and research for the previous year. These reports will include project progress, data presentations, conference attendance, manuscript publication and class performance and must be signed by the mentor prior to submission. These will be given to the Director, who will arrange a meeting with the student to evaluate the progress and formulate key milestones for the upcoming year. Each meeting will also include the report and milestones from the previous year. In the event that there is deemed to be insufficient progress, a meeting with the student and mentor will be arranged to address concerns. The progress report documents can be obtained from Ms. Terri Roberson.
Pre-Dissertation Research Project Requirement

In year 2, the student will complete a pre-dissertation research project under the direction of their mentor. The student is expected to have input into the design of the study, to have primary responsibility for collection and analysis of the data, and be an author on any manuscript or abstract that results from the work. It is not required that the student supply the original idea for the project. To fulfill the requirement, a written research report must be submitted to the Steering Committee. It is not required that the work be published or that the study produced conclusive or positive results. Instead, it is necessary that the student demonstrate an ability to present their research in an appropriate context, a good understanding of experimental design and statistical analysis, and the ability to write clearly. The director will retain a copy of the manuscript in the student’s file. The document should be in the format of the journal that it will ultimately be submitted to and contain a title page, abstract, introduction, results, discussion, and reference section.

Successful completion of the pre-dissertation research requirement is required before a student can begin the Qualifying Examination. The requirement must be completed during the student’s second year in the program and submitted at the end of that summer (September 15).

Pre-Dissertation Research Project Committee

The Pre-Dissertation Research Project Committee reviews the pre-dissertation research document and the student will be informed of any changes that are needed. Members of the Behavioral Neuroscience Steering Committee are chosen to serve as the review committee for the student’s pre-dissertation research project. Typically, the Director chooses two faculty members to review the pre-dissertation research project plus the Director. The project should be submitted to the committee on or before September 15 of the student’s third year in the program. The reviewers provide feedback to the student on the project and the student revises the manuscript until the reviewers either accept or reject the project.
Qualifying Examination Requirement

In year 3, the student will complete a Qualifying Examination. The purpose of the Qualifying Examination is to evaluate the student’s ability to integrate previously learned material and to increase the breadth of the student’s knowledge. Completion of the requirement by the specified deadline reflects the student’s ability to organize their time and plan ahead, qualities important for professional success. Successful completion of the Qualifying Examination is required for admission to candidacy for the Ph.D. The Qualifying Examination project should be approved by the student’s committee by the end of the first semester of year 3. This will ordinarily entail one meeting between the student and the Qualifying Examination committee. It is expected that students will continue to be active in their laboratory research during preparation of the Qualifying Examination. The Qualifying Examination must be completed by the beginning of the student’s fourth year in the program (September 15) and before the dissertation proposal. Failure to meet this deadline will be grounds for denying admission to candidacy. If a student is unable to meet the deadline for completion of the Qualifying Examination, he or she must petition the Steering Committee for an extension. The petition must be made at least one month before the deadline and should be made in the form of a memo to the Director stating the reason for the delay and requesting an extension of no more than one month after the deadline.

OPTION 1: Grant Proposal

Option 1 is to write a 12 page R01 application and a six page Appendix (see below). Use the current NIH R01 Format for the 12 page portion. The current R01 proposals have one page of Specific Aims and 12 pages of text covering Research Strategy, Significance, Innovation, Approach and Research Design and Methods. References should be included but they do not count in the 12 page limit. Use the format on the NIH website as your guide. You don’t have to include a preliminary data section unless you choose to do so.

As noted above, you should also include an Appendix. The Appendix is being requested because we are asking for evidence of greater knowledge about background information. It will require a separate reference section. The Appendix can also include expansion of information from the Research Design and Methods section, e.g., a more complete explanation of power analyses or supplemental statistical tables, but if this type of Appendix material is presented it would be in addition to the six page Appendix for the introductory material.

The topic may reflect either a subsequent dissertation topic or some aspect of research that is not intended to serve as a dissertation topic. In both cases, the format and content should reflect the NIH guidelines.

If the topic will serve as a subsequent dissertation topic, then the student should generate all aspects of the proposal as original material (specific aims, background, research design and analysis) and be able to defend all aspects of proposal. Specifically, the proposal can’t reflect material obtained from a mentor’s grant proposal; i.e., it must be original although it is likely to be complementary to their mentor’s research.

If the topic is not to serve as a dissertation topic, then any topic within the broad domain of behavioral neuroscience can be chosen as a focal point for the proposal. That is, the topic and major technique used to study that topic (e.g., neurophysiology, neurochemistry, neuroanatomy) is open to the student with approval by the committee although there should be
some discussion of the behavioral relevance of the topic incorporated into the proposal. The behavioral treatment must reflect a scholarly discussion of the issue and may not, for example, be limited to a discussion of the health relevance of the issue.

In either case, the idea should initially be presented to the qualifying examination committee in a brief (3-5 pages) written format and a formal presentation (15-30 minutes) at a meeting in the fall term of Year 3. In this written statement, the student will identify the problem, discuss why it is important, and state how it will be addressed. Once approved the student has until September 15 of the following year (Year 4) to prepare a final draft. It is expected that full use of the page limitations of the NIH format will be required to successfully complete the project. The student will provide copies of the grant proposal to the qualifying examination committee at the deadline and the committee has two weeks to review the proposal. The committee will give feedback (electronically or in scheduled meetings) and the student can make necessary changes.

Finally, the student will present a brief summary of the grant proposal (30-45 minutes). After the discussion with the student about the grant proposal is completed, the committee will reach a consensus about whether the student has passed the examination. A decision of "pass" is based on both an acceptable written document and on the student demonstrating adequate knowledge and a relatively sophisticated conceptualization during the oral presentation.

**OPTION 2: Review Paper**

Option 2 is a comprehensive, integrative review paper of an area of the student’s choice. The topic may be related to the student’s primary area of research. The goal of the paper is to (1) increase the student’s breadth of knowledge in the area, including review of relevant historical papers and (2) integrate or synthesize the available research findings with the goal of achieving new insights which may guide future inquiry.

To focus the review, students are encouraged to formulate one or more questions or aims toward which their review will be directed. Students are encouraged to consult with their mentor and with other faculty who have special expertise in the area they plan to review about the questions posed and about the scope of the proposed paper.

Students should prepare a 3-5 page summary of the proposed paper that will be distributed to the committee and program director. The summary should include (1) a brief statement on the background of the issues to be examined, (2) a clear statement of the questions to be asked by the review or of the aims of the review, (3) a brief summary of the types of information which will be included (e.g., human clinical studies, physiological, anatomical, etc.), and (4) if appropriate, indicate key papers or laboratories (e.g., that define a controversy). Students may contact committee members for feedback about the summary if they have specific questions with which the faculty member might be helpful in answering. It is important that the committee and the student reach agreement about the scope of the paper, about its goals and about any potential problem areas that must be investigated before the project is approved. The committee and the student may wish to establish a timetable for completing the paper, keeping in mind that the deadline for this requirement is September 15 of Year 4 in the program.

Satisfactory completion of the qualifying examination will be determined based on the paper submitted by the deadline. It is not acceptable to submit a partially complete paper at the
deadline. The final paper should be between 20 and 30 pages in length and cite at least 30 - 40 references. When completed, the student should distribute the paper to the committee, including the Program Director, all of whom have two weeks to review the document. Faculty will read the paper carefully and suggest substantive and editorial changes which will improve the manuscript and make it more suitable for publication and those changes will be conveyed to the student (electronically or in scheduled meetings).

Finally, the student will present a brief summary of the scope of the review (30-45 minutes) and the questions posed. A focus on the insights gained during the review is encouraged. The student should indicate what implications the review has for future research and for the research of other laboratories. After the discussion with the student about the paper is completed, the committee will reach a consensus about whether the student has passed the examination. A decision of "pass" is based on both an acceptable written paper and on the student demonstrating adequate knowledge and a relatively sophisticated conceptualization during the oral presentation.

The student should prepare the paper in the format of the journal for which it would be an appropriate contribution. Students are encouraged to submit the paper for publication after the comments of the Qualifying Examination Committee have been incorporated. Submission of the paper for publication is not, however, necessary to meet the qualifying examination requirement for admission to candidacy.

**Qualifying Examination Committee**

Students form a Qualifying Examination Committee in the fall semester of Year 3 (after successful completion of the pre-dissertation research project) and develop a plan for completing the Qualifying Examination. The Qualifying Examination Committee consists of four faculty members; at least three of the faculty must hold primary appointments in the Department of Psychology. The student’s mentor normally serves as the chair of this committee.
Dissertation Proposal

Students prepare a dissertation proposal in an NIH grant proposal format. Typically, the student gets their committee together and sends a document with some background material and the specific experiments proposed to be part of the dissertation. The experiments outlined in the proposal document can/will include experiments already performed as well as those to be performed – everything that will be a part of the dissertation document. This document is similar to the current 12 page NIH R01 format, without preliminary studies (7-8 pages). Most of the work comes at this point where experiments are evaluated and approved/disapproved. Often students propose too many experiments and it is recommended that some be eliminated. This is followed up with a Proposal meeting where the student presents the background and proposed experiments to the Dissertation Committee in a short PowerPoint talk. The committee examines the proposal and gives feedback on the document and talk regarding the appropriateness of the proposed experiments.

Approval of the dissertation proposal by the dissertation committee has a contractual aspect. That is, the student agrees to complete the proposed studies and the committee agrees that completion of the proposed work (and previous work) will constitute sufficient empirical work for the dissertation.

The student should consult with the advisor about the scope of research in their area that would constitute a dissertation project. In addition, students may wish to review the dissertations on file in the Department of Psychology Office completed by other students in our program. In general, the dissertation research should answer one or more substantive questions. In the dissertation, the student demonstrates his or her status as an expert in their field. Thus, in addition to reporting the results of experiments conducted, the general introduction and general discussion are important aspects of the dissertation.

The Behavioral Neuroscience program adopts the Guide to Preparation for Theses and Dissertations available from the Graduate School. However, the student may prepare the dissertation in a "traditional" format or by using manuscripts prepared for publication as chapters. With either format, an abstract which encompasses the entire project must be prepared. A general introduction and general discussion section must be included in which the student draws together the studies which comprise the dissertation. Manuscripts must be reformatted to conform to the dissertation format. The student should consult with the committee about the format planned for the dissertation prior to preparing the final document for dispersion. The committee should make explicit their suggestions about preparation of the dissertation. In the event that a manuscript-based dissertation is planned, the contribution of the student to each manuscript must be delineated. Furthermore, no two students can include the same manuscript as part of their respective dissertations, regardless of the effort from each.

The Private and Public Defense

Following completion of the proposed research, the full written document is distributed to the Dissertation Committee by the student. A pre-defense meeting (private defense) is first scheduled for at least 2 weeks following dissertation distribution, although the committee in some cases may require more time. The student will defend the dissertation at this pre-defense meeting. This pre-defense meeting includes a 45-minute presentation followed by questioning by the committee. The committee may make suggestions for modifications of the dissertation.
document and the oral presentation. The student must make these corrections and has two weeks to submit the revised dissertation back to the committee members. The committee members then normally may take up to two weeks to read the dissertation prior to the public defense. If additional changes are required this process may have to be repeated. At the public defense, scheduled after the full private defense approval by the committee, the student will present a departmental colloquium and respond to questions from the general audience. The committee and the student will then have a closed meeting in which the project and the area(s) of expertise of the student can be discussed more fully.

The committee may recommend further changes to the dissertation document if necessary before the Ph.D. is awarded.

**Dissertation Committee**

The student chooses a Dissertation Committee and final approval is made by the Dean of the Graduate School on the basis of the recommendation of the Director. Three members of the Dissertation Committee must hold primary appointments in the Department of Psychology and at least one must hold a primary appointment outside the Psychology Department (can be mentor). The student’s mentor serves as the chairperson of the Dissertation Committee. If the mentor is outside of the Department of Psychology, a co-chair will be selected to ensure that Departmental requirements are met. The Dissertation Committee meets with the student at the proposal meeting, the private and the public defense.

The dissertation committee is best viewed as a group of individuals who have the following characteristics and should be selected on this basis. They should have some expertise in some aspect of the proposed research. They should have a commitment to working with the student to successfully complete the proposed research. This includes being actively involved in discussing the project and providing any suggestions that will improve its design, and being available to the student at mutually convenient times to discuss the project and provide assistance. Students should feel free to consult with their committee members at any time during preparation of the proposal, the collecting and analyzing of data, and the preparation of the dissertation. Viewing the dissertation committee as allies who share a commitment to the dissertation project will improve the quality of the experience and avoid unnecessary anxiety about the dissertation process. If the student is concerned that his or her committee is not functioning as described above, then the director should be informed and the situation will be investigated.

**Changes to the Proposal**

If changes from the proposed research are necessary, then the student has the responsibility of consulting with the committee about proposed changes. If a major change in the aims or research plan is considered, consultation with the committee is required. Changes in the proposed research plan should be delineated in the form of a memo and may require an interim meeting of the dissertation committee. This memo will serve as an amendment to the dissertation proposal and will be viewed as mutually binding after approval by the dissertation committee. This memo should indicate what was deleted from the original proposal. The memo should also describe in detail the experiment(s) that will be added, including the rationale, design and specific methods. Committee members will review this memo and indicate to the student their assent or their wish to further discuss the proposed change by
returning a page on which they check "approve" or "do not approve" and sign their names. The intent of these procedures is to increase communication between the student and their committee and prevent misunderstandings about the scope of the project.

**Award of the Ph.D.**

Awarding of the Ph.D. requires that (1) all course requirements be completed, (2) the dissertation is completed, (3) the dissertation be defended at a private and public defense where it is presented as a departmental colloquium to which all faculty and students are invited. The public defense will be published in the UAB Reporter and fliers must be put up throughout the campus notifying the public of the defense. The recommendation that the Ph.D. be awarded is contingent on a written document of high quality and the judgment of the committee that the student has successfully presented and defended their work. The dissertation will be accepted by the Graduate School only in the format specified by their guidelines.
# Behavioral Neuroscience Program Requirements Checklist

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<th>Required Courses</th>
<th>Course #</th>
<th>Hrs</th>
<th>Date Completed/Grade</th>
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<tbody>
<tr>
<td>Foundations of Behavioral Neuroscience</td>
<td>PY 753</td>
<td>3</td>
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<tr>
<td>Advanced Topics in Behavioral Neuroscience</td>
<td>PY 754</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Introduction to Statistics</td>
<td>PY 716</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Applied Statistical Analysis</td>
<td>PY 717</td>
<td>4</td>
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<th>Elective Courses</th>
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<th>Hrs</th>
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**Pre-Dissertation Research Project**

Manuscript approved by Steering Committee Members  

**Qualifying Examination**

Committee Members (four members)  

Qualifying Exam Topic approved  

Qualifying Exam Approved by Committee
**Dissertation Proposal**

Committee selected and approved by Graduate School

Committee Members (four members)
________________ (mentor)
________________
________________
________________

Proposal approved by committee

Admitted to candidacy

Dissertation accepted by committee
Milestones in the Behavioral Neuroscience Graduate Program

Introduction to Neurobiology (VIS 729)

Foundations of Behavioral Neuroscience (PY 753)
Advanced Topics in Behavioral Neuroscience (PY 754)
Introduction to Statistics (PY 716)
Applied Statistical Analysis (PY 717)

2-3 laboratory rotations

Choose mentor

Year 2

Sept 15 Pre-dissertation Research Project Submitted

Choose Qualifying Examination Committee

Year 3

Sept 15 Qualifying Exam Completed

Dissertation Proposal Meeting

Year 4

Dissertation Sent to Committee
Private Defense
Public Defense

Year 5

Ph.D. Awarded
Master’s Degree in Behavioral Neuroscience

The Behavioral Neuroscience Graduate Program does not accept students desiring to achieve a Master’s Degree. However, the program does award a Master’s Degree to students under certain circumstances. These typically involve the student leaving the program prior to completion of the Ph.D. after having successfully completed the core program curriculum and research requirements listed below. The Master’s degree is a terminal degree for a student and re-admission to the program requires a new application.

Successful completion of the following courses:  

<table>
<thead>
<tr>
<th>Course</th>
<th>Course #</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foundations of Behavioral Neuroscience</td>
<td>PY 753</td>
<td>3</td>
</tr>
<tr>
<td>Introduction to Statistics</td>
<td>PY 716</td>
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<tr>
<td>Applied Statistical Analysis</td>
<td>PY 718</td>
<td>4</td>
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<tr>
<td>Advanced Topics in Behavioral Neuroscience</td>
<td>PY 793</td>
<td>3</td>
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<tr>
<td>Research Seminar</td>
<td>PY 756</td>
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<tr>
<td>Four Elective Courses</td>
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</tr>
<tr>
<td>Pre-Doctoral Graduate Research</td>
<td>PY 798</td>
<td>18</td>
</tr>
</tbody>
</table>

Total 48

Qualifying Examination

A qualifying examination approved by a qualifying examination committee is required for the degree. Guidelines as previously noted.
Policies Regarding Adequate Academic Progress

Definition of Adequate Academic Progress

Adequate academic progress includes successful completion of required courses and degree requirements in a timely manner. Failure to make adequate academic progress will result in a review of the student’s academic progress by the Steering Committee. Failure to make adequate academic progress occurs when:

- A student earns two grades of “C” in required courses, including earning a “C” twice in the same course. Dropping a course because a grade of “C” is anticipated will be viewed as earning a “C” and will trigger a review of academic progress.
- A student does not meet the deadlines established for successful completion of the pre-dissertation research project, qualifying examination or dissertation proposal.
- A student does not put forth effort in laboratory research that is commensurate with the number of credit hours taken and his or her stage of training.

The possible actions that may be taken are as follows.

- The student, the mentor, and the Steering Committee will develop a plan in order to improve the student’s progress and remediate any deficits. The plan will specify actions required of the student and deadlines for completion of each aspect of the plan. Contingencies for failure to successfully accomplish the plan to improve academic progress will also be specified.
- The student will be advised to take a leave of absence. A leave of absence is a period of excused absence from the program during which the student does not receive a stipend. This option will be used only if the student’s difficulties resulted from a situation that can be resolved during the absence.
- The student’s stipend will be suspended due to failure to make adequate academic progress.
- The student will be dismissed from the program.

Policy on Grades of “C”

In non-required courses, the program does not demand that the course must be repeated and a passing grade earned. The student may elect to retake a non-required course, e.g., to raise their GPA. In required courses, students must earn a passing grade of either A or B. Students who earn a “C” in a required course must repeat that course and earn a passing grade. There is one exception.

If a student earns a “C” in the Introduction to Statistics course, the instructor may be petitioned by the student to allow the student to demonstrate competence prior to the beginning of the spring semester of the first year to take a competency examination. However, the instructor is under no obligation to do so. The result of the competency examination should be communicated to the director of the program in the form of a memo signed by both the student and the Introduction to Statistics instructor. If the student passes the competency examination,
the C remains on their transcript, but the student is given permission to register for the Applied Statistical Analysis course during the following semester. A student who fails to pass the alternate form of the examination may not register for the Applied Statistical Analysis course during the spring semester of their first year and must repeat the Introduction to Statistics course during the second year. The option to demonstrate competency by taking an alternate examination is not available for “C’s” in Applied Statistical Analysis. This course must be repeated and a passing grade earned.

Policy on Remunerated Activities

Students on Fellowships

The fellowships awarded to first year students explicitly prohibit any outside activities for which remuneration is received. Fellowships from other sources may also prohibit other paid activities; the student is responsible for being aware of stipulations made by the fellowship.

Students contemplating additional work related to their graduate training, e.g., teaching or laboratory work, must seek the advice of the director before making a commitment. Factors that will be considered include the potential for the experience to contribute to the student’s training, the student’s progress through the program and the extent to which the additional activity is likely to compete with the demands of the program. In most cases, students will be discouraged from accepting teaching assistantships or other positions until they have completed the majority of their coursework and are admitted to candidacy.

A student who desires work that is unrelated to their graduate training must inform the Program Director.
Dr. Franklin R. Amthor (amthorf@uab.edu)

Dr. Amthor’s career has been devoted to understanding neural computation, both for its own sake, and for the sake of making neural prostheses that restore and augment human function. His specific research has been to investigate complex neural computations in retinal ganglion cells, the first locus in the visual system of highly specific and nonlinear analyses such as motion and directional selectivity. The response properties of retinal ganglion cells arise from bipolar and amacrine cell inputs interacting with mechanisms exhibited by ganglion cells’ dendritic trees. The first task Dr. Amthor took on as a retinal researcher was to identify, by intracellular recording and staining, all the major ganglion cell classes in a mammalian retina (rabbit), including directionally selective, orientation-selective and edge-detecting ganglion cells. Following this necessary, pioneering, and now “classic” work, Dr. Amthor has investigated the retinal circuitry and mechanisms underlying complex receptive field properties such as directional selectivity, including the receptor types exhibited by various ganglion cell classes, and their projection targets in the brain in order to understand the role of different ganglion cell classes in various aspects of visual acuity and perception.

These investigations have used virtually the entire suite of single cell neurophysiological techniques, including single cell extracellular recording, sharp electrode intracellular recording and staining, patch clamp recording, optical imaging with both calcium and potentiometric dyes, dual electrode recording, and, most recently, microelectrode array recording.

This research has been supported by the NEI over a continuous, 20 year period of support. Some computational aspects were also supported by the Sloan Foundation and the Office of Naval Research, while the EyeSight Foundation of Alabama has supported some efforts having clinical implications. His current interests involve further translating his basic research on the retina to the development of neural prostheses both for the visual system and for other disabilities. The penetrating microelectrode arrays he has developed have the capabilities of high bio-compatibility in terms of materials and mechanical flexibility, as well as very large size electrode counts. Dr. Amthor also has two other active projects involving haptic (skin) stimulation to improve mobility in blind and low vision patients. He believes that combining a variety of interfaces between humans and computational machinery is the most promising approach for replacing functions lost, such as vision or paralysis.

Dr. Mary Boggiano (mboggiano@uab.edu)

Dr. Boggiano is concerned with describing the neurochemical basis of abnormal eating behavior and with the development of animal models of human binge-eating disorders. Past areas of research involved the development of animal models of binge-eating using environmental manipulations such as access to highly palatable food, dieting, stress, and non-food cues. Drug, in vivo microdialysis HPLC, and RIA studies implicated changes in mu-opioid and Y2-receptor function, mesolimbic monoamine release, and HPA axis hormones to explain binge-eating. Dr. Boggiano’s animal models (“stress-induced binge-eating” and “Binge-eating Prone/Resistant (BEP/BER)” models are being used in academic and industry labs to gain a better understanding of the physiology of binge-eating disorders and obesity and to indemnity novel treatments. Current interests are focused solely on human research and including the
development, validation, and administration of a novel “Palatable Eating Motives Scale” in adolescents, teens, college students, and weight-loss seeking adults. The scale should improve treatments for obesity by identifying one’s motive behind eating palatable foods. She is also testing the efficacy of transcranial direct current stimulation (tDCS) to reduce food cravings and binge-eating symptoms in humans. Future studies will aim to identify gene and neuroendocrine markers that distinguish various palatable-eating motives types and the neurochemistry behind tDCS effects on eating behavior.

**Dr. Burel Goodin** (bgoodin1@uab.edu)

Dr. Goodin is a licensed clinical health psychologist with specialty training in pain-related behavioral medicine. As the director of the Biobehavioral Pain Research Laboratory at UAB, Dr. Goodin has expertise and experience with experimental models of evoked pain using quantitative sensory testing. He has developed and refined methods to assess pain sensitivity and modulation (e.g., endogenous inhibition and facilitation) using dynamic experimental pain stimulation modalities such as heat, cold, pressure, and induced ischemia. Alongside his research team, Dr. Goodin has recently incorporated quantitative sensory testing into several studies aimed at better understanding risk factors for clinical pain severity and poor physical function among older adults with knee osteoarthritis.

**Dr. Rajesh Kana** (rkana@uab.edu)

Dr. Kana studies the brain mechanisms underlying cognitive and social functions in people with autism spectrum disorders (ASD). His research has contributed to the disrupted brain connectivity model, a promising neurobiological account of autism (Image below shows patterns of posterior to anterior connectivity in individuals with autism and in typical control participants). His Cognition, Brain, and Autism Lab (www.uab.edu/cbra) has been using multimodal neuroimaging techniques, such as functional and structural MRI, diffusion tensor imaging (DTI), and magnetic resonance spectroscopy (MRS) to characterize the brain in autism at functional, anatomical, and neurochemical levels. Recent publications from Dr. Kana’s lab report the neural mechanisms of social cognition and language processing in children and adults with ASD. Translational neuroimaging is another important area of focus in his research. Dr. Kana’s Ph.D. was in Psychology from Indian Institute of Technology (IIT), Delhi, India, where he studied language and communication in autism. His initiation into neuroimaging research was at UCLA where he was a William Fulbright pre-doctoral visiting fellow in 2001. His postdoctoral training was in neuroimaging and autism at the Center for Cognitive Brain Imaging, Carnegie Mellon University, Pittsburgh. Dr. Kana has published a number of studies in the last few years that have contributed significantly to a better understanding of the brain in autism.

**Dr. David Knight** (knightdc@uab.edu)

Dr. Knight earned a B.S. in Psychology at Truman State University, a M.S. and Ph.D. in Neuroscience and Clinical Psychology at the University of Wisconsin-Milwaukee, and completed his post-doctoral research at the National Institute of Mental Health. Dr. Knight’s laboratory (labs.uab.edu/knightdc) is focused on better understanding the neural
substrates of human learning, memory, and emotion using magnetic resonance imaging (MRI) techniques that include functional MRI, diffusion tensor imaging, and magnetic resonance spectroscopy. Behavioral and MRI studies from the lab investigate questions that are important for understanding healthy, as well as dysfunctional, emotion processes. For example, recent work from the Knight lab has investigated the neural circuitry that supports emotion regulation processes. Disruption of these processes appears to play an important role in the emotional dysfunction associated with mood and anxiety disorders. Studies from the Knight lab will help determine neural mechanisms that mediate susceptibility/resilience to stress, and offer insights into the development of emotion-related disorders.

Dr. Robert Sorge (rsorge@uab.edu)

Dr. Sorge’s research follows a few central themes:

**IMMUNE SYSTEM MODULATION OF PAIN:**
It is now accepted that the immune system plays a primary role in the experience and development of chronic pain. Dr. Sorge’s lab is currently investigating the nature of this role and ways in which the immune system can be altered to alleviate chronic inflammatory and neuropathic pain through the use of genetic, pharmacological and behavioral interventions.

**IMMUNE SYSTEM MODULATION OF ADDICTION:**
Drugs of abuse elicit an immune response in the body and within the brain. Dr. Sorge’s lab is currently investigating how changing the functioning of the immune system and the inflammatory processes alters the reinforcing value of classical drugs of abuse in rodent models of addiction. To learn more, please visit uabimpactlab.com.

Dr.Edward Taub (etaub@uab.edu)

Dr. Taub has developed a set of techniques, termed Constraint-Induced Movement Therapy (CI therapy), effective in reducing the incapacitating motor impairment often associated with stroke, traumatic brain injury, and other types of damage to the CNS. The work stems from research with monkeys given somatosensory deafferentation and is based on the principle that a portion of the chronic motor deficit after CNS injury is due to a learning phenomenon, termed “learned nonuse,” rather than to the organic damage per se. Constraint-Induced Movement therapy has been shown to produce a substantial increase in “use-dependent cortical plasticity.” Recent research has correlated the motor improvement in patients with brain damage changes in brain plasticity as revealed by structural magnetic resonance imaging (MRI). The work to date shows that (a) CI therapy increases the cortical grey matter of patients given CI therapy after stroke, MS, and cerebral palsy. There are changes in white matter tracts as well as revealed by TBSS. The grey matter increase is in the sensorimotor cortex, other motor areas, and the hippocampus. (b) In control subjects given an alternate therapy there is no change. New projects involve using CI therapy for the rehabilitation of movement in veterans of the Iraq/Afghanistan Wars with traumatic brain injury and in tetraplegic patients with high spinal cord injuries.
Dr. Bulent Turan (bturanb@uab.edu)

Dr. Turan’s research examines the mechanisms underlying the relationship between social bonds and well-being. One area of focus is understanding how people use (or do not use) supportive relationships effectively at times of stress and how this affects emotional and physical health. A second area of focus is the effects of negative social evaluation on psychological and physical well-being (particularly hormonal responses including cortisol, testosterone, and alpha amylase reactivity). Current projects involve laboratory stress procedures to specify the mechanisms underlying hormone responses. These studies generally use the Trier Social Stress Test and other laboratory procedures, and aim to understand the role of negative evaluation and social support on hormonal reactivity. Such reactivity is hypothesized to be an important determinant of chronic emotional (as well as physical) health problems. Other projects apply the construct of fear of negative evaluation to the context of HIV/AIDS to examine the effects of HIV-related stigma and discrimination among persons living with HIV.

Dr. Jarred Younger (younger@uab.edu)

Dr. Younger received his Ph.D. in Experimental Health Psychology in 2003 at the University of Tennessee, Knoxville. He then completed postdoctoral fellowships at Arizona State University and the Stanford University School of Medicine before taking an Assistant Professor position at Stanford. He is now joining the UAB faculty in Psychology, with secondary appointments in Anesthesiology and Rheumatology. He is currently funded by the National Institutes of Health and the Department of Defense to study new techniques for diagnosing and treating neuroinflammation. The Neuroinflammation, Pain and Fatigue Laboratory uses neuroimaging, pharmaceutical, and immunological techniques to understand and treat chronic diseases. “We believe that low-level inflammation of the brain drives pain, fatigue, depression, and cognitive decline in millions of people. Low-level inflammation may also drive memory problems and fatigability as people age. We also investigate the impact that addictive drugs (such as opioid pain medications) have on the human brain. We use magnetic resonance imaging (MRI), pharmacologic MRI (phMRI), diffusion tensor imaging (DTI), and magnetic resonance spectroscopy (MRS) neuroimaging techniques. “

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