

Behavioral and Cognitive Neuroscience Program Student Handbook

Welcome to the program in Behavioral and Cognitive Neuroscience (BCN). BCN is one of the Training Areas in the CUNY Doctoral program in Psychology and a component of the CUNY Neuroscience Collaborative, which provides Neuroscience training to students in both Biology and Psychology. Your presence in the program reflects choices on both our parts. Your choice is based on your assessment of the suitability of this program to meet your individual interests; ours on our confidence in your promise as students and researchers. At several points in this process you will make additional choices, initially as to laboratory rotations, potential training mentors and research topics. During the first few years, we will be trying to develop an individualized research-training program for each of you. Towards that end, we will also be assessing you, both formally and informally, to identify both your strengths and your weaknesses. This assessment will include your course grades, your work in research rotations and your performance in several formal examinations that are milestones in your progress towards the Ph.D. degree. During this period, it will be the responsibility of the Program to provide you with the advice, the knowledge and the laboratory experience that will make it possible for you to successfully meet the challenge of each of these assessments and to complete the Dissertation within the time period (5 years) for which guaranteed financial support is available. (Note: During the first 1-2 years, this support will make it possible for you to focus, with a minimum of distractions, on your course and laboratory work. During the final years, you will be obligated to provide some of that support, by teaching or research assistantships). The material presented below provides an overview of the steps in student progress towards the degree.

I. ORIENTATION: Your First Year in the Program: Early in your first semester you will attend an orientation session at the CUNY Graduate Center during which you will meet some of your fellow students who are also neuroscientists-in-training from both the Psychology and Biology Programs. Some of the more advanced students will present posters or oral presentations based upon the work they have done in their laboratory rotations to give you some sense of the breadth of ongoing research by faculty and students in the neuroscience programs. This may also suggest some possibilities that will assist your own choices for your first year laboratory rotations. If you are interested in a specific laboratory, it is a good idea to talk to one of the students in the lab for an insider's view of the lab and its utility for research training. You will also meet with your Advisory Committee, the group that will guide you through your first years of training and will eventually be replaced by your Dissertation Committee.

II. Advisory Committee: The Advisory Committee will include faculty members with interests and experience in research areas in which you have expressed an interest. If you have expressed a strong desire to work with a particular faculty member, we will ensure that he/she will be a member (probably the Chair) of your Advisory Committee. Among its formal functions, the Committee will provide guidance in course selection and laboratory rotations, will provide feedback on rotation reports and one or more of its members will serve as examiners for the First and Second Doctoral Exams. On an informal level, these are the people to turn to for help if you find yourself in difficulty during the first years of your training.

III. Coursework: Table I presents a schematic of the course of study recommended for BCN students. However, the precise training program followed by each student should be decided based upon continuing consultation with their Advisory or Dissertation Committees. As indicated in Table 1, students should have completed the bulk of their coursework by the end of their second year. In addition to their Research Rotations and four semesters of Colloquia, all students will take the Neuroscience Sequence, (NS I, II) which will provide them with a common core of knowledge in the fundamental Neurosciences, including Molecular, Cellular and Developmental, Behavioral, Cognitive and Systems Neuroscience. **Note:** To pass this sequence, students must achieve a B average or better over the two courses, with no

grade *lower* than a B-. Thus, a student can get a B- in NS1 and B+ in NS2 and meet the requirement. If the student gets a C+ or lower in either course, they must retake the course.

Two Quantitative/Methods courses are required including, but not restricted to Statistics. (Permission of the Advisory Committee is required for course substitutions to the Quantitative requirement). In addition, in preparation for their professional responsibilities as researchers and teachers, training in both these areas is mandatory. The Responsible Conduct of Research (RCR) requirement may be met by a combination of an NIH-workshop and a formal course in Ethics, offered at the Graduate Center. The teacher training requirement may be met either by completion of a specific teacher-mentoring program or teaching course at one of the colleges, or by the Teaching course offered each year at the Graduate center. *Neither of these courses counts as a formal elective.*

As you begin to focus in on the areas of your specific research interests, you will choose from a variety of elective courses designed to add breadth and depth in those areas. These courses will help to provide the domain-specific knowledge required to develop and defend the research proposal which will form the basis for the Second Examination. Because the interests and skills of each student will vary, your program of course work for each semester should be decided in consultation with your Advisory Committee. (See Appendix) for a listing of quantitative/methods and elective courses). Table I also indicates (in Bold) the program Milestones, which includes the First and Second Doctoral Examinations, student Colloquia presentations and the Dissertation defense.

Table I.
Behavioral and Cognitive Neuroscience Doctoral Program
Curriculum, Credits and **Milestones**

YEAR 1		YEAR 2					
Semester 1		Semester 2		Semester 3		Semester 4	
Neuroscience I	4 cr	Neuroscience II	4 cr	Elective	3 cr	Elective	3 cr
Rotation I	5	Rotation II	5	Ind Research	5	Ind. Research	5
Quantitative I	3	Quantitative II	3	Ethics	3	Elective	3
Colloquium	1	Colloquium	1	Colloquium*	1	Colloquium	1
Totals	13		13		12		12
			26 cr				50 cr
				First Examination taken this year			
				Student presentation			
YEAR 3		YEAR 4		YEAR 5			
Semester 5 and 6		Semester 7 and 8		Semester 9 and 10			
Ind. Research	10	Dissertation Research		Dissertation Research			
			60 cr				
Second Doctoral Exam		Student Presentation		Dissertation Defense			
Distribution of Credits							
Neuroscience I/II	8						
Quantitative Methods	6						
Colloquium	4						

Electives 9
Professional Studies 3- 6
Research 30

60 cr

Courses of special Interest to BCN students

Course Title	Semester	Venue
Animal behavior I [Mechanisms]	Fall	Hunter
Methods in Cognitive Neuroscience	Spring	TBA
Neuroanatomy	Fall	Queens
Medical Neuroanatomy	Winter	City (Sophie Davis)
Neuropharmacology	Spring	Queens
Seminar: Topics in Behavioral NS	Fall	TBA
Seminar: Topics in Cognitive NS	Spring	TBA
Theoretical & Computational NS	Spring	GC

IV. Research Rotations:

Function: Like most doctoral programs, our training model is the scholar-scientist, equipped to teach at the university level, obtain postdoctoral fellowships and, throughout their careers, compete regularly for external funding to support their research and maintain their labs as state-of-the art research and training facilities. At the heart of this model is the assumption that doctoral training involves an apprenticeship and that the people best equipped to provide that training are those faculty who themselves exemplify the training model. For this reason, the most substantial component of the student’s first year will be time spent in research rotations. These may have several functions. For the student who has expressed an interest in a specific lab, the rotation can serve as a reality check on both the research topic and the mentor. For students who are uncertain as to the direction they wish to pursue, it provides an opportunity for exploration. For this reason, the student’s Advisory Committee has great flexibility in assigning rotations. The student's first year of research training will usually include two Rotations in laboratories to be determined by the Advisory Committee. However, upon the recommendation of the student's Advisory Committee, and the permission of the EC, the student may do a third rotation during the summer or remain in one lab for the entire year. In the latter case, the second rotation must be completed before the start of the 3rd year.”

Assessment: For each semester spent in a laboratory, the student will receive an evaluation from the laboratory director. The evaluation will be based both upon the student's performance over the course of the Rotation and upon the quality of a written research proposal, using the DSRG format*, which must be submitted prior to the end of the semester. The mentor will provide the student with an initial critique of the proposal, to be discussed with the student, and is expected to work closely with the student to improve the proposal prior to its final submission. The final version of the proposal and a letter of evaluation will then be submitted to the Training Program Director and the Advisory Committee with a letter grade recommendation *at least one week prior to the end of the grading period*. The mentor’s letter should cover such issues as (a) goals of the rotation and the extent to which they were achieved; (b) student punctuality with respect to lab meetings and specific assignments; (c) degree to which the student showed independent thinking and was prepared to take the initiative on appropriate aspects of the project; (d) an assessment of the student’s strengths and weaknesses as reflected in their performance. **Note: both the proposal and the letter must be submitted in order for a final grade to be officially assigned.** Based upon a discussion with the Advisory Committee, the student may accept the grade or appeal it to the EC. In either case, a final grade must be assigned before the start of the next semester. *Note: the number of references to be allowed shall be decided by the mentor.

http://www.gc.cuny.edu/CUNY_GC/media/CUNY-Graduate-Center/PDF/Research%20Funding/DSRGguidelines.pdf

V. Colloquia: The program offers a regular colloquium series during which faculty and students present their ongoing research and distinguished guest speakers introduce you to cutting-edge research in Neuroscience-related areas. For new students, this provides an opportunity to review possible venues for a laboratory rotation. All students are required to enroll in and attend at least 3 semesters of the colloquium series during their first two years.

Milestones in the student's progress towards the Dissertation

I: The First Doctoral Examination

Overview: The goal of the first doctoral exam is to ascertain whether the student has acquired the fundamental skills and domain-specific knowledge necessary to critically assess and generate research in a neuroscience-related discipline. Their acquisition will provide a foundation for the independent program of research that will ultimately serve as the student's doctoral dissertation. Therefore, the student is advised to choose a topic for the first doctoral exam that is related to one of their rotations or research courses and closely aligned to the student's planned area of dissertation work. The first doctoral exam will take the form of a written report (either a literature review or a research report), which will serve as the focus for an oral examination. The Examination will be conducted by a First Doctoral Exam Committee, assembled by the student with the approval of the Advisory Committee, and composed of three members, including the proposed Dissertation mentor and two BCN faculty members with expertise in the report's research area.

A. Preparation Timeline:

1. Decisions on the format and topic of the report and the membership of the Examination should be completed by the end of September of the student's 2nd year.
2. Preparation of the report will involve several initial drafts and revisions prepared in consultation with the student's mentor and a final draft, approved by the mentor, to be submitted to the Examination Committee no later than the last day of classes of the 1st semester of the student's 2nd year.
3. The final document requires approval of the Examination Committee, which may request additional revisions to produce a written document acceptable as the basis for the oral exam. The report may go through no more than 2 such revisions before the oral exam may be scheduled. It will therefore be in the student's interest to complete the final draft as early in the semester as possible, providing an opportunity for Examination Committee comments and revisions in time for scheduling of the oral examination.
4. The oral examination must be scheduled by January 15th and *completed* by the end of the first month of the spring semester.

B. Examination Format:

General guidelines for literature review or research report:

- The report should be a minimum of 8 pages single-spaced (or 16 pages, double-spaced), 12-point font, not including references, tables or figures, which will be attached at the end of the paper (in typical manuscript style).
- Guidelines for the maximum length are at the discretion of the Examination Committee, but it is expected that the typical paper will be 10-15 pages single-spaced (or 20-30 pages, double-spaced).

- The report should contain a minimum of 15 references, but the total number of references and their composition (empirical vs. review) are at the discretion of the committee.
- The references should contain both seminal works relevant to the topic, as well as state-of-the-art research (published within recent months/years).
 - It is strongly advised that the student consult with members of their Examination Committee on the bibliography for their report before they begin the majority of their writing in order to ensure that the scope of their report will meet the Examination Committee's expectations.

Specific guidelines for Research Report: The written report should be based upon research carried out during the first year and should reflect both the student's research interests and those of the lab where they plan to pursue their dissertation research. The research report should be in the standard scientific format for that discipline.

In general, the research report will be successful if it:

- Begins with a clearly motivated research question and contextualizes that question within the appropriate field or discipline (including broader impact)
- Chooses appropriate methodologies for answering the research question, thus demonstrating discipline-specific knowledge in experimental design and analysis
- Demonstrates appropriate design and implementation of tables and figures
- Aligns evidence with concluding arguments
- Is well-organized and leads the reader clearly from research question to methods to results and interpretation.
- Demonstrates that the student has internalized practices of good scientific writing (<http://course1.winona.edu/mdelong/EcoLab/21%20Suggestions.html>)

Specific guidelines for Literature Review: The review should have a central and specific unifying theme or thesis (it is also possible to have subthemes/theses). The purpose of starting with a central thesis is to ensure that the student does not simply provide an exhaustive and disorganized listing of findings in a given domain, but rather, pulls together existing knowledge that supports a specific thesis, acknowledges and discusses any known findings that may refute that thesis (and/or is inconsistent with the majority of research on the topic), and provides a conclusion with suggestions for future research that may further explore and/or disambiguate remaining issues germane to that topic/thesis.

The scope of the thesis and associated review should be narrow enough to be tractable, but not so narrow as to fail to put the thesis in the broader context of the field.

Tables and figures can be used, as long as they are used judiciously to clarify points and have appropriate captions. Tables and figures from other sources can be included, as long as they are appropriately cited.

The thesis need not be entirely novel, but the student should frame the thesis and evidence provided for or against it entirely in their own words. **Plagiarism, in any form, will not be tolerated and will be grounds for failure and dismissal from the program.**

In general, the review will be successful if it:

- Is clearly defined in terms of scope, including what will be and will not be covered
- Synthesizes relevant existing information and knowledge (rather than simply listing findings without central cohesion)
- Aligns evidence to arguments
- Distinguishes among competing theories (if relevant)

- Demonstrates discipline-specific methodological knowledge
- Contextualizes the topic within the field or discipline at large
- Is well-organized and leads the reader clearly through the thesis and evidence
- Demonstrates that the student has internalized practices of good scientific writing (<http://course1.winona.edu/mdelong/EcoLab/21%20Suggestions.html>)

C. Oral Examination Format: The oral examination component of the first doctoral exam will take place before the First Doctoral Examination Committee, but may include additional faculty members and students (i.e., as part of a research symposium). If a larger audience is held, it is up to the discretion of the committee whether to allow questions from this group.

- The oral defense will be approximately 1-hour in total, and will consist of a 20-minute presentation by the student, followed by questions from the committee.
- The presentation is designed to demonstrate the ability of the student to extract key points from their report and present them in a clear and coherent manner, both orally and visually.

C. Assessment: Evaluation will be based upon both the quality of the written report and the response of the student to the Examination Committee's questions. A Pass will be awarded if the Examination Committee decides that the student has gained the fundamental skills necessary to critically assess and generate research, and has acquired the domain-relevant knowledge of the chosen research area. Failure of the exam may be based either upon the student's failure to demonstrate these qualities, to generate an acceptable report after 2 revisions, or to meet any of the deadlines noted above. Failing students will be given one more opportunity to pass the first doctoral exam, and the Executive Committee and mentor will set a new timetable for this requirement. A second failure will result in expulsion from the program.

II. Second Doctoral Examination

Overview: Passage of the second doctoral exam is the next step in the student's progress towards the development and completion of the Doctoral Dissertation. The Exam has two components, each with its own function; a research proposal prepared independently but with assistance from the student's mentor and a formal oral examination by the student's Second Doctoral Examination Committee. The primary goal of the Second Doctoral Examination is to determine whether the student has mastered the relevant research literature and acquired the research skills needed for proceeding towards thesis research. These include (1) the ability to formulate hypothesis-driven and defensible Specific Aims and research strategies designed to accomplish those aims, and (2) the ability to think on their feet and to frame the potential "pitfalls" of their research proposal (controls, alternative approaches, etc.). Additionally, given that the proposal will incorporate elements of the student's Ph.D. thesis project, this examination will serve to evaluate the adequacy of the student's preparation to undertake those studies, and provide a critique of the research proposal that will help guide the student in the further development of the dissertation.

A. Research Proposal Format: Based upon preliminary data and discussions with the thesis sponsor, the student will prepare a document in the form of a grant proposal modeled directly on the National Institute of Health (NIH) pre-doctoral fellowship program. The written document follows the guidelines laid out for that program (Ruth L. Kirschstein national research service awards (NRSA) for individual predoctoral fellows (f31)), which can be accessed at the following website: <http://grants.nih.gov/grants/guide/pa-files/PA-04-032.html>. The NRSA fellowship format, with the attendant sections on research plans, training program etc., represents a comprehensive test of the student's overall focus and ability to design creative research. All sections of the NRSA proposal must be completed except for those sections that are

indicated to be written by the sponsor. While it is recognized that all student's work strongly reflects the general theoretical and thematic thrust of the mentor's lab, the proposal should clearly identify those elements which reflect the independent contribution of the student. *At least one Specific Aim must be developed entirely independently of the mentor.* This aim must be explicitly indicated in the grant proposal and will be critiqued for originality and creativity. Students will be encouraged to think "out of the box."

B. Preparation Timeline and Documents: Prior to taking the 2nd Exam, students should have fulfilled the bulk of the Behavioral and Cognitive Neuroscience program course requirements. In order to allow sufficient time for feedback and to allow for any adjustments in committee member selection, the following document should be submitted to the Executive Committee for approval at least one month prior to the scheduled date of the Exam.

- 1) The title, or working title, of your dissertation.
- 2) A paragraph or two describing your research (This should be less formal than an abstract, but still give the reader a basic understanding of your work).
- 3) A list of proposed committee members
 - a. Include at least one sentence per committee member explaining why you have included him or her.
 - b. While your advisor should be on your committee, remember to include committee members who are not directly involved with your research.
- 4) CVs for committee members who are outside the CUNY system along with a completed Outside Reader form
- 5) The planned date of your examination

C. Examination Committee: The Second Doctoral Examination Committee consists of three examiners plus the student's mentor (for a total of four). The student submits to the Behavioral and Cognitive Neuroscience Executive Committee a list of 5 faculty members with competence in the proposed research topic. At least two of the examiners chosen must be from the Behavioral and Cognitive Neuroscience program. The third examiner can be from another program within the CUNY Psychology graduate program or an external examiner from another institution, pending approval of the Executive Committee. The Executive Committee may choose to appoint its own examiners if the submitted list is deemed to be inappropriate. One of the Behavioral and Cognitive Neuroscience faculty members serves as chair of the committee. During the examination, the mentor will function solely as an observer and will not be present during the decision regarding grading.

D. Oral Examination Format: The oral examination should take a maximum of 2 hours, beginning with a 30-minute oral presentation of the proposal that should include any preliminary data bearing on its feasibility. Questions during the presentation should be kept to a minimum and should be for purposes of clarification only. During the remainder of the oral examination period, the student's mentor should not participate unless expressly requested to do so by the committee chair.

F. Assessment: Following the oral exam, the examination committee will vote: Pass, Conditional Pass (typically requiring revision of the written document), or Fail. Students who are eligible and who have prepared a proposal of sufficient quality will be strongly encouraged to submit their proposals for funding consideration to the NIH. Should a student fail the second doctoral exam, a comprehensive and objective review of the student's progress will be undertaken by the Behavioral and Cognitive Neuroscience Executive Committee, taking into account grades received for coursework, performance on the exam, and laboratory productivity as indicated by the mentor. If the student's overall progress is deemed to be insufficient by the Committee at this stage, the student will be required to leave the program. If a student

who has failed the second doctoral exam is deemed through this review to be making generally satisfactory progress otherwise, the student may then receive approval to retake the second doctoral exam the following year. A second failure will lead to immediate dismissal from the program.

Under exceptional circumstances (e.g., illness, a mentor switch, serious academic difficulties), a student is allowed to defer the 2nd Exam for one year on recommendation of the Program Director and with the endorsement of the Executive Committee.