

Graduate Program Requirements in Behavioral Neuroscience (Revised May 2018)

Introduction

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Introduction:

Students matriculate into the Behavioral Neuroscience Graduate Program each Fall semester and are expected to conduct research and participate in courses on a continuous basis. Core coursework should begin immediately and laboratory research should be initiated early in the first year. The general requirements of the PhD program include:

- a) A series of core courses and an individualized course plan designed by the student's committee
- b) A preliminary examination that should be completed by June 1st following the first academic year of enrollment.
- c) A comprehensive examination that should be completed by July 1st prior to the third academic year of enrollment.
- d) The doctoral dissertation and dissertation defense.

Each of these requirements is discussed below under separate headings. In addition, the area requires one year of teaching experience (see #7, below). A typical schedule for completion of these requirements is presented at the end of this document (see Appendix A). It should be noted that any deviation from the formal requirements must be requested in writing to the student's advisory committee. This petition will only be honored with *written approval of the **Committee Chair** and the **Program Director***. Failure to achieve the prescribed requirements can be grounds for probation and/or dismissal from the graduate program.

1. Progress and Evaluation Committees:
 - a. The direction of a student's training will primarily be the responsibility of the primary advisor/mentor.

- b. First year committee: Upon admittance to the program, the Program Director, in consultation with the primary advisor, will arrange a committee composed of the primary advisor and two other faculty members (usually from BN, but may be from other areas in the Department or other academic units). This committee is charged with assisting in the development of the student and to monitor their progress. The committee will help the student select courses, consult with the student on research, execute the preliminary examination, and may continue to serve on the student's other committees. This committee is required to meet with the student once each semester during the first year; if the committee is unable to meet during this time, a written evaluation of the progress co-signed by the student and committee members is acceptable.
- c. Comprehensive examination and dissertation defense committees: These committees will be appointed to assist the student with the preparation of the plan of study and to guide and examine the doctoral dissertation. This committee is required to meet with the student once a year until the dissertation defense to evaluate thesis preparation and progress. The committee must be composed of at least 5 faculty who have current [graduate faculty appointments](#) and must adhere to the following requirements:
 - i. At least three members will have primary appointments in the BN program.
 - ii. One must be from another graduate program (e.g. Cognitive, Clinical, BPSG, etc) in the Department of Psychology and Neuroscience.
 - iii. One external member must be from the graduate faculty outside the Department of Psychology and Neuroscience.

It is the responsibility of the student to submit to the Program Director a potential list of faculty who are willing to serve on this committee prior to the start of the student's second academic year. The Program Director will submit this list to the Department's Associate Chair for Graduate Education for approval. Changing or adding additional members from outside or inside of the Department can be appointed by petitioning the Program Director.

2. Annual Evaluation:

The student must arrange an annual committee meeting to discuss progress in the program including completed coursework, research progress and future directions. In addition, at the end of each academic year the program faculty will meet to evaluate the progress of each student. As part of this evaluation, the Program Director will ask each student to submit a *Summary of Accomplishments* form to the Program Director and committee members. The faculty will also consider the input from the primary advisor, committee members, other faculty and information about TA performance to determine if the student is making adequate progress. The Program Director will provide the student with a letter summarizing the results of this evaluation.

3. Course Requirements:

The core curriculum for the students in the Behavioral Neuroscience PhD Program is in register with that of the Interdepartmental Neuroscience PhD Program with the exception that Behavioral Neuroscience students are expected to take statistics. All students are required to take the Core Curriculum:

- a. Core Courses (19 credit hours):
 - i. Introduction to Neuroscience 1 (NRSC 5100 – 3 credit hours)
 - ii. Introduction to Neuroscience 2 (NRSC 5110 – 3 credit hours)
 - iii. Fundamental Neuroscience Topics (PSYC 6841 - 1 credit hour)
Students must take 2 semesters for a total of 2 credits, and should be taken concurrently with NRSC 5100/5110.
 - iv. Advances in Neuroscience (NRSC 6100 – 2 credit hours) Students must take 3 semesters for a total of 6 credits.
 - v. Statistics (PSYC 5741 or equivalent - 3 credits). Student must take at least one semester of statistics. Must be passed with at least a C in order to count as credit. The mentor will decide which statistics course the student shall take, based on the student's anticipated research direction.
 - vi. Scientific Writing (MCDB 6440 or equivalent - 2 credits)
 - vii. The core course requirements must be met by the end of the second year, unless the courses are not offered during this period and/or approved by the program director.
- b. Elective Courses (11+ credit hours):
 - i. A list of elective courses can be found [here](#).
 - ii. The elective courses can be completed at any time during the tenure of a student's course of study.
- c. Total credit hours required for the program: 60
 - i. Course Credits (total hours: 30+)
 1. Core Courses – students must take 19 credit hours of core courses.
 2. Elective Courses – students must take 11+ hours of electives.
 - ii. Dissertation hours (PSYC 8991): students must take **at least** 30 dissertation hours in preparation for their dissertation defense.
 1. A student may not register for more than 10 dissertation credit hours in any one semester, including summer.
 2. Prior to the semester in which the student completes the Ph.D. level comprehensive exams, a student is not allowed to have accumulated more than 10 dissertation hours. However, if the student has enrolled in more than 10 dissertation hours prior to completing the comprehensive exams, they may petition the Dean of the Graduate School to have those hours included in their final total.
 3. Not more than 10 dissertation hours of credit taken the semester in which the comprehensive exam is passed may be included in the 30 credit hours required for the degree.

4. After the student completes the Ph.D. level comprehensive exam, they must be enrolled in at least 5 dissertation hours for every semester until they successfully defend the dissertation. Students can enroll in as many as 10 dissertation hours per semester (including Summer) after they have completed their comprehensive exam.
 - d. Resident Requirements: At least 24 semester hours of courses at the 5000 level or above are required (the Graduate School allows 6 of these hours to be 3000-4000 level courses); at least 20 of the required hours must be in graduate courses taken at the University of Colorado at Boulder.
 - e. Transfer of credit: Transfer credits from accredited institutions may be petitioned to the Program Director and will be reviewed on a case-by-case basis. Transfer credits must adhere to the [Graduate School Rules](#) and satisfy an equivalent course offering within the Behavioral Neuroscience Graduate Program.
4. Preliminary Examination:

Each student who wishes to study for the doctoral degree must qualify by satisfactorily passing the preliminary examination by June 1st of the first academic year. The examination includes 3 components:

 - a. Fundamental Neuroscience topics I: Students are expected to satisfactorily pass (B or better) the final examination of NRSC 5100.
 - b. Fundamental Neuroscience topics II: Students are expected to satisfactorily pass (B or better) the final examination of NRSC 5110.
 - c. Breadth: Students will enroll in an independent study in the Fall and Spring semesters of the first year. The independent study will be directed by the primary advisor and 1st year committee. Students must evaluate and critique the scientific literature in breadth areas determined by the primary advisor and 1st year committee. It is expected that three breadth areas will be evaluated in each of the two semesters. At the conclusion of each semester, an evaluation form including the topic(s) that were evaluated must be signed by the committee stating satisfactory completion and returned to the Program Director to be placed in the student's record.

The student must file a petition to extend the deadline for this requirement. This petition will be submitted to the Program Director and outline the reasons for the extension. The Program Director will then meet with the student's committee to determine if the student should be granted an extension and to stipulate the length of the extension.

5. Comprehensive Examination:

Admission to candidacy for the PhD degree will be determined by successful completion of a comprehensive examination in the field of concentration and related areas. The evaluation of oral examination should occur prior to July 1st of the second academic year in the program. The examination may take the form of a grant proposal, which may serve as a thesis defense proposal, or a review paper to

evaluate a particular hypothesis (see Appendix B and C). To advance to candidacy the examination committee must judge the student's written document as satisfactory, and the student must pass an oral defense of the paper/proposal and the student's broader knowledge of the field. The oral examination will be closed to the public, but open to faculty members of the Behavioral Neuroscience program.

Before attempting the examination, the student will have:

- a. Completed at least three semesters of residency, and successfully completed the preliminary examination.
- b. Made formal application for Admission to Candidacy on forms supplied by the Graduate School at least two weeks before the comprehensive examination is attempted.

The student must file a petition to extend the deadline for this requirement. This petition will be submitted to the Program Director and outline the reasons for the extension. The Program Director will then meet with the student's committee to determine if the student should be granted an extension and to stipulate the extent of the extension. Failure to complete the Comprehensive Examination in a timely manner is grounds for probation and/or dismissal from the program.

The examination can be evaluated at 3 levels as determined by the committee:

- i. *Passed at the Doctor of Philosophy Level:* The student has passed the examination at a high level by meeting all expectations for either the grant proposal or the review paper. This is the expected outcome for most students.
- ii. *Failure at the Doctor of Philosophy Level, Option to Revise the paper/proposal:* The student does not pass at a high level, but is given an opportunity to revise the paper. If the paper is sufficient in many respects, but has a few notable deficiencies that are relatively straightforward to address, then the option to revise will be considered. If however, the paper is deficient in many ways and/or severely so, then revision will not be an option.
- iii. *Failure at the Doctor of Philosophy Level:* The student does not pass, and will not be advanced to candidacy for the doctoral degree.

6. Doctorate of Philosophy Dissertation:

- a. Advisory Committee: The student should obtain the signatures of members of the advisory committee (thereby indicating their willingness to serve) on a [Doctoral Examination Report](#) form; one copy to be given to the chair of the advisory committee, one to the Director of Graduate Studies in Psychology and Neuroscience, and one to be placed on file in the program office. Any change in the advisory Committee is to be similarly reported. It is the student's responsibility to arrange an annual committee meeting to keep the advisory committee informed of the progress in his or her research and training, and of any significant change in the direction or status of his or her program. The Graduate School must also be advised of any changes in degree program after the Application for Candidacy is filed.

- b. Final Examination. This is the traditional thesis defense. It will be open to the public. The student and primary advisor will be responsible for scheduling the public examination.

The Final Examination will not be scheduled until the primary advisor has received copies of the complete properly formatted thesis to distribute to the committee and to make available to the public. The primary advisor will contact the members of the thesis committee to schedule the final examination. The examination will be scheduled no sooner than two weeks after the primary advisor and Program Director have received copies of the thesis and distributed them to the committee.

As noted, the final examination will be open to the public. The examination will have three components:

- i. The student will give a 45-minute formal presentation of the thesis.
 - ii. A period with questions from anyone in the audience
 - iii. A closed questioning period with the student's formal committee.
- c. Student's Responsibility. The requirements of the Behavioral Neuroscience program are consistent with those of the Graduate School. It is the student's responsibility to see that these requirements (including total credit hours, advanced registration for examination, etc.) are met. It is important to pay careful attention to the rules governing the various examinations, thesis preparation, resident requirements, etc., as they are set forth in the [Graduate School Rules](#).

7. Additional Requirements:

The following are requirements that must be met prior to admission to candidacy for the Ph.D. degree:

- a. Individualized Coursework. Course requirements, beyond core course requirements, will be designed individually for each graduate student based on their background and anticipated research/specialty areas. The student's advisory and committees will help to formulate this plan.
- b. Teaching Experience. All students are required to gain teaching experience by serving as teaching assistants for a minimum of two semesters.
- c. Works in Progress (NRSC 6602: Behavioral Neuroscience Professional Skills Development): Beginning in the second year, all graduate students are required to give a Works in Progress presentation of their research progress. Failure to comply with this requirement can be grounds for probation, withholding of financial support or dismissal from the program.

8. Optional Master of Arts Degree:

A Master's degree may be obtained *en route* to the Ph.D. or in rare cases pursued as a terminal degree. The main purpose of pursuing a Master's degree is if a student decides to complete their studies at this level and not continue on to complete a Ph.D. No students are admitted to our program with the expectation that they will obtain a Master's degree *en route* or as a terminal degree. The degree requirements include 30 hours of graduate coursework and a Research Report, as agreed upon by the committee. At least 24 semester hours of the graduate coursework must be

5000 level or above, and 4 to 6 hours must be PSYC 6951 (Master's Thesis Hours or Independent Study Hours). The Research Report is equivalent to the traditional Master's Thesis and must be defended before the student's committee prior to May commencement [graduate school deadlines](#) of the third academic year. The student and primary advisor will be responsible for scheduling the examination. The examination will be scheduled no sooner than two weeks after the examination committee and Program Director have received copies of the thesis. One of the following options may be used for the Research Report to complete the Master's degree:

- a. Master's Thesis Option: The student will take 4-6 credits of Master's Thesis Hours and complete a Research Report as a thesis. The thesis will be defended in front of the student's committee (comprised of 3 graduate level faculty members) and the public. If passed, the student will then submit the thesis to the Graduate School, following their [submission guidelines](#) and payment of applicable Graduate School publication [fees](#).
- b. Independent Study/Master's Level Comprehensive Exam Option: The student can take 4-6 credits of Independent Study Hours (PSYC 6841) (they CANNOT take Master's Thesis Hours with this option) in addition to the Independent Study hours for the Core requirement (Section 3a) or other classes if needed. The student will then defend their Research Report as a master's level comprehensive exam instead of as a master's thesis. The examination may take the form of a grant proposal or a review paper to evaluate a particular hypothesis (see Section 5, Appendix B & C). The exam will be defended to the students' committee (3 graduate level faculty members) and will be closed to the public but open to any other Behavioral Neuroscience faculty who wish to attend.

Both options can be evaluated at 3 levels as determined by the committee:

- a. *Passed at the Doctor of Philosophy Level:* The student has passed at a high level and can continue toward the pursuit of the Ph.D. This is the expected outcome for most students.
- b. *Failure at the Doctor of Philosophy Level, Masters Level Pass Only:* The student passes with a Master's degree, but is not allowed to continue toward pursuit of the Ph.D. beyond the third year (i.e., the student may complete the present academic year.)
- c. *Failure at Master's Level:* The student is not awarded a Master's degree, and is not allowed to continue toward pursuit of the Ph.D. beyond the third year.

9. Probation and Grounds for Dismissal:

- a. The following are some reasons for placing a student on probation and/or dismissal from the Behavioral Neuroscience graduate program:
 - i. The student has failed to meet the specified deadlines for the Core courses, Preliminary Examination, Comprehensive Examination, or Doctoral dissertation requirements without appropriately petitioned extensions.
 - ii. The student's cumulative grade point average (GPA) falls below 3.00.

- iii. The student has earned grades that make it impossible to return to good academic standing and/or to successfully complete the program.
 - iv. The student fails the Preliminary Examination, Comprehensive Examination or Dissertation Defense.
 - v. The results of the student's Annual Evaluation determines that the student is failing to meet interim expectations making the completion of the degree and requirements untenable.
 - vi. The student committed academic/research misconduct or other ethical violations.
 - vii. The student has exhibited prohibited behaviors as outlined in the University of Colorado's [Student Code of Conduct](#).
- b. Written notification of probation will be provided to the student, the primary advisor and the student's committee detailing the reason for probation and necessary corrective action. Should a student be placed on probation in two consecutive semesters, a motion to dismiss the student will be filed during the Annual student evaluation.
 - c. A motion to dismiss a student from the Graduate Program will be brought forward during the Annual student's evaluation by the Program Director or Chair of the student's committee. Student dismissal procedures can be also be requested by the Program Director or Chair of a student's committee at other times of the year, which will require the scheduling of a special Behavioral Neuroscience faculty meeting convened at the request of the Program Director for faculty evaluation and vote. A simple majority (50%) vote of Behavioral Neuroscience Program Area faculty is required for student dismissal from the program.
 - d. The faculty vote outcome will be final; it is the responsibility of the student to follow the Graduate Program requirements, and to avail themselves of extensions in cases of attenuating/unforeseen circumstances (for example, family, medical, military or others). If a student determines the dismissal or termination was unfairly cast, the Graduate School has defined [grievance policies](#) that should be followed.

Appendix A

Typical Calendar for Graduate Training in Behavioral Neuroscience					
	Year 1	Year 2	Year 3	Year 4	Year 5
Coursework	Fall NRSC 5100 (3) PSYC 6841 (1) PSYC 5741 (3)	Fall NRSC 6100 (2) MCDB 6440 (2) NRSC Elect (3)	Fall NRSC Elect (3) PSYC 8991 (5+)	Fall PSYC 8991 (5+)	Fall PSYC 8991 (5+)
	Spring NRSC 5110 (3) PSYC 6841 (1) NRSC 6100 (2) NRSC 6602 (1)	Spring NRSC 6100 (2) NRSC Elect (3) NRSC 6602 (1)	Spring NRSC 6602 (1) PSYC 8991 (5+)	Spring PSYC 8991 (5+) NRSC 6602 (1)	Spring PSYC 8991 (5+) NRSC 6602 (1)
Credits	13 Core 1 Elective	6 Core 7 Elective	3 Elective 10+ Dissertation	1 Elective 10+ Dissertation	1 Elective 10+ Dissertation
Milestones	Preliminary Examination Annual Evaluation	Comprehensive Examination Annual Evaluation	Annual Evaluation	Annual Evaluation	Dissertation Defense

Appendix B

Approved by BN Faculty July 18, 2011

Behavioral Neuroscience Program Guidelines for a Review Paper Satisfying the Comprehensive Examination Requirement

This document provides general guidelines for writing a review paper to satisfy the comprehensive examination requirement.

Stages of the Proposal

Initiation Stage

The process begins with a discussion between the student and advisor. The purpose of the initial phase is to settle on a topic to review and ensure that it is reasonable to pursue it. The student will then meet with the full committee to gain approval to begin the development and writing of the review.

Pre-submission Phase

During this phase the student is free to discuss ideas and approaches to the review topic with the advisor and other individuals (fellow graduate students, postdoctoral students, and other faculty) who may provide insight into the development of the proposal.

The Penultimate Draft

The written penultimate draft should be the work of the student. When completed the penultimate draft can be turned into the advisor for comments. The advisor can discuss any glaring weaknesses in the review and make suggestions for improvement. However, it is not appropriate for the advisor to rewrite any section of the document. Moreover, the advisor is only permitted to comment once on any section of the document.

The Final Proposal

After the advisors comments are obtained the student will incorporate them into the final draft that will then be handed to the committee and a defense will be schedule.

Overall document

The final review document should be of a total length of 25-40 pages (double spaced), excluding the reference section. The page total includes any illustrations, figures, or tables that are added to support the text. All margins should be 1.0 inch, and the font type should be either Verdana 11 point or Arial point 12 point.

Review Format

Abstract 300-400 words

The abstract will provide a crisp summary of the review. It should state

- The goal of the review
- The major contents
- Main Conclusions

Introduction

This section should be 1-3 pages (double spaced) and serve several of the functions described below:

- Briefly introduce the topic;
- Describe why it is important;

- Describe the goal of the paper;
- Describe the plan of attack--what literatures are going to be reviewed and the order (Note: this should provide you with organizational headings of the body of the review);
- In some cases you will want to alert the reader at this stage to what you will conclude from your review.

Note that it is generally wise to complete the introduction after the literature review—for the simple reason that you will then have a full idea of the content of the paper and consequently what needs to be introduced.

The Review

This section should be 20-30 pages (double spaced). It should be organized around the plan of attack described in the introduction. Each section should end with a brief summary and provide a transition to the next section.

Discussion

- This section should be 3-5 pages (doubled spaced);
- Restate the motivation/goal of the paper;
- Summarize the evidence that has been reviewed;
- Provide a crisp summary of the implications of the summary focusing on how this review has clarified our understanding of the issues raised in the introduction.

Concluding Comments 1-2 pages (doubled space)

Often a good review will end with some concluding remarks that go a little beyond the original plan of the paper but are tied to the fundamental question that was addressed.

Appendix C

Approved by BN Faculty July 14, 2011

Behavioral Neuroscience Program Guidelines for a Grant Proposal Satisfying the Comprehensive Examination Requirement

This document provides general guidelines for writing a grant proposal to satisfy the comprehensive examination requirement.

Stages of the Proposal

Initiation Stage

The process begins with a discussion between the student and advisor. The purpose of the initial phase is to settle on a topic and ensure that it is reasonable to pursue it.

The student will then meet with the full committee to gain approval to begin the developing and writing of the proposal.

Presubmission Phase

During this phase the student is free to discuss ideas and approaches to the problem with the advisor and other individuals (fellow graduate students, postdoctoral students, and other faculty) who may provide insight into the development of the proposal.

The Penultimate Draft

The written penultimate draft should be the work of the student. When completed the penultimate draft can be turned into the advisor for comments. The advisor can discuss any glaring weaknesses in the proposal and make suggestion for improvement. However, it is not appropriate for the advisor to rewrite any section of the document. Moreover, the advisor is only permitted to comment once on any section of the document.

The Final Proposal

After the advisors comments are obtained the student will incorporate them into the final draft that will then be turned into to the committee and a defense will be schedule.

Format of the Proposal

Proposal Title: 81-character limit, including spaces

Specific Aims (2-to 3 aims): 1 page

Background (2-4 pages)

Research Strategy: 10 pages (excluding references)

Note that the combined Background+Research strategy sections should not exceed 12 pages.

Biosketch: 4 pages

Font

- Use an Arial, Helvetica, Palatino Linotype or Georgia typeface, a black font color, and a font size of 11 points or larger. A symbol font may be used to insert Greek letters or special characters; the font size requirement still applies.
- Type density, including characters and spaces, must be no more than 15 characters per inch.
- Type may be no more than six lines per inch.
- Use black ink that can be clearly copied.
- Print must be clear and legible.

Paper Size and Page Margins

- Use standard size (8 ½" x 11") sheets of paper.

- Use at least one-half inch margins (top, bottom, left, and right) for all pages, including continuation pages. PI's name should not appear in the margins

Page Formatting

- Because a number of reviewers will be reviewing applications as electronic documents and not paper versions, applicants are strongly encouraged to use only a standard, single-column format for the text. Avoid using a two-column format since it can cause difficulties when reviewing the document electronically.
- The application must be single-sided and single-spaced.
- Consecutively number pages throughout the application. Do not use suffixes (e.g., 5a, 5b).
- Do not include unnumbered pages.

Figures, Graphs, Diagrams, Charts, Tables, Figure Legends, and Footnote

- A smaller type size is acceptable, but it must be in black ink, readily legible, and follow the font typeface requirement.

Grantsmanship

- Use English and avoid jargon.
- If terms are not universally known, spell out the term the first time it is used and note the appropriate abbreviation in parentheses. The abbreviation may be used thereafter.