

RUTGERS, THE STATE UNIVERSITY OF NEW JERSEY

Busch Campus, New Brunswick, New Jersey

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GRADUATE PROGRAM IN BEHAVIORAL & SYSTEMS NEUROSCIENCE (BSN)

BSN PhD students need 24 research credits and 48 course credits to graduate. 30 of the course credits (10 one-semester graduate-level courses) are typically derived from formal coursework, while 18 course credits are typically derived from various individualized “research course” credits as described below.

TEN COURSES TOWARDS THE PH.D. DEGREE

(Three credits each = 30 of the required 48 total course credits)

1. Five CORE Courses are Mandatory (no choices)

830:521	Research Design & Analysis I
830:543	Conditioning & Learning
830:567	Cellular Neurophysiology & Functional Neuroanatomy
830:568	Behavioral & Systems Neuroscience
830:647	Methods in Behavioral & Systems Neuroscience

2. One additional statistics course (your choice)

830:522	Research Design & Analysis II
830:540	Mathematical Models of Learning & Cognition: Model Testing and Probabilistic Inference
960:555	Methods in Non-Parametric Statistics
960:567	Applied Multivariate Analysis
960:667	Multivariate Statistics

3. Four additional elective courses chosen from the pool of recurring BSN courses and rotating seminars. At least one of these courses should emphasize neuroplasticity. (Note that BSN-relevant courses outside the department may be elected, with prior approval of the BSN Area Coordinator.)

BSN-related recurring courses:

830:556	Human and Animal Aggression
830:558	Psychopharmacology: Theory & Practice
830:591	Functional Neuroanatomy
830:585	Psychoneuroimmunology
830:591	Behavioral Endocrinology
830:514	Sensation & Perception
830:546	Memory & Attention
830:580	History & Systems of Psychology
830:644	Behavioral Neuroepigenetics
830:642	Learning-induced Neuroplasticity: From Genes to Networks

Recent examples of BSN-relevant SEMINARS (typically offered under the generic course numbers 503, 504, 646, and 647):

Autism & other Neurodevelopmental Disorders	Federal Grant Writing Seminar
Neurobiological Implications of Animal Cognition	Neurobiology of Mental Illness
Structure & Interpretation of Scientific Inquiry	Computational Neural Plasticity & Behavior
Introduction to Neuropsychological Assessment	Behavioral Pharmacology
Comparative Development of Learning & Memory	Emotion & Motivation
Neural Circuitry of Mood Disorders	Neuroscience of Addiction
Big Questions in Neuroscience	Translational Neuroscience
Neuroendocrine Responses to Stress	

18 ADDITIONAL COURSE CREDITS TOWARDS THE PH.D. DEGREE

(18 of the required 48 total course credits)

The remaining 18 course credits comprise **ANY** combination of a) Advanced Studies in Psychology, b) Non-thesis Research in Psychology, or c) additional Electives or Seminars (besides the 10 courses above).

ADVANCED STUDIES IN PSYCHOLOGY (830: 503; 504; 3 credits each)

Reading and individual study, involving written and oral reports. By arrangement on an individual basis with a faculty member.

NON-THESIS RESEARCH (830: 501; 502; variable credit)

Course credit for research not directly related to master's or doctoral theses.

24 ADDITIONAL RESEARCH CREDITS TOWARDS THE PH.D. DEGREE

RESEARCH IN PSYCHOLOGY (830: 701; 702; variable credit)

Research credit (usually after the first year) for research directly related to Master's or Doctoral Theses.

Formal Summary of Curriculum Requirements:

CURRICULUM REQUIREMENTS FOR THE PH.D. DEGREE

To obtain the Doctor of Philosophy degree, a BSN student must have completed the Master's Degree, Qualifying exam and a total of at least **24 Research credits** (830: 701; 702) and **48 course credits**. (Thus, BSN requirements comply with the Rutgers Graduate School minimum requirement of 72 credits, of which at least 24 must be research credits, and with the Psychology Graduate Program requirement of a minimum 24 research credits and 48 course credits.)

(CURRICULUM REQUIREMENTS FOR THE EN ROUTE MASTER'S DEGREE)

To obtain the Master of Science degree, a BSN student must have completed at least 6 research credits (830: 701; 702) and 24 course credits (including at least 15 course credits from CORE courses; no more than 6 Non-thesis Research credits may be counted toward the Master's degree).

Sample BSN Curriculum

Year 1

Fall: Cellular Neurophysiology & Functional Neuroanatomy, Research Methods & Analysis I, Non-Thesis Research (3 course credits)

Spring: Behavioral & Systems Neuroscience, Research Methods & Analysis II, Non-Thesis Research (3 course credits)

Year 1 credits: 4 courses, 18 course credits, 0 research credits

Running total: 4 courses, 18 course credits, 0 research credits

Year 2

Fall: Conditioning & Learning, Grant Writing Seminar, Research in Psychology (3 research credits), Master's Proposal

Spring: Methods in Neuroscience, Psychoneuroimmunology, Research in Psych (3 research credits)

Year 2 credits: 4 courses, 12 course credits, 6 research credits

Running total: 8 courses, 30 course credits, 6 research credits

Year 3

Fall: Neural Circuitry of Mood Disorders, Non-thesis Research (3 course credits), Research in Psych (3 research credits), Master's Thesis

Spring: Neural Plasticity course, Non-thesis Research (3 course credits), Research in Psych (3 research credits), Qualifying Exam

Year 3 credits: 2 courses, 12 course credits, 6 research credits

Running total: 10 courses, 42 course credits, 12 research credits

Year 4

Fall: Non-thesis research (3 course credits), Research in Psych (3 research credits), Dissertation Proposal

Spring: Non-thesis research (3 course credits), Research in Psych (3 research credits)

Year 4 credits: 0 courses, 6 course credits, 12 research credits

Running total: 10 courses, 48 course credits, 18 research credits (*coursework and credit requirements complete!*)

Year 5

Fall: Research in Psych (9 credits)

Spring: Research in Psych (9 credits), Dissertation defense

Final total: 10 courses, 48 course credits, 24 research credits

REQUIREMENTS FOR THE PH.D.

The following guide is meant as a reference for the Ph.D. requirements. As a primary note, these requirements are subject to change and it is the student's responsibility to cross-reference this document with guidelines from [The School of Graduate Studies](#) and to seek the guidance of the Senior Graduate Administrator within the Department of Psychology at each stage.

To obtain the Doctor of Philosophy degree, a Behavioral Neuroscience student must have completed the Master's Degree, Qualifying Exam and a total of at least 24 research credits (830: 701; 702) and 48 course credits. Each of these are described in detail below.

Deadlines at a Glance:

Master's Proposal Approved: End of 3rd semester

Master's Thesis Approved: End of 5th semester

Qualifying Exam Passed: End of 7th semester

Dissertation Defended: End of 10th semester

If a student enters the program with an acceptable Master's degree from another institution, then the deadline for completion of the Qualifying Examination is the end of the 5th semester.

THE MASTER'S THESIS

1. Master's Proposal

The student should establish a committee of *at least three faculty members* to serve on the master's advisory committee by the beginning of the third semester. The committee normally consists of three Psychology faculty, including the primary advisor acting as committee Chair. A fourth member from outside the Department may be included if scientifically appropriate. The membership of the committee requires the approval of the Area Coordinator, Vice Chair for Graduate Studies, and Department Chair. Forms for signatures indicating approval should be obtained from the Psychology Graduate Senior Administrator.

The student prepares a written proposal for the scientific content of the master's thesis. This document typically includes an introduction, methods, preliminary results (including figures), discussion, and references. The format and length of the proposal is flexible and at the discretion of the individual committee, but a typical length is 6 single-spaced pages plus references and figures. A proposal format compatible with an NIH predoctoral NRSA (F31 award) is highly encouraged. The proposal must be presented formally to the committee (either in a private meeting or as part of the master's day presentations), who discuss it with the student as a group and/or individually. Revisions may be required. DEADLINE: Final approval is by vote of the committee members and should be obtained by the end of the 3rd semester. **Forms for signatures indicating final approval should be obtained from the Psychology Senior Graduate Administrator or can be found on the [Psychology Department Website](#).**

2. Written Master's Thesis

The student submits a written master's thesis consisting of the results of their research (either as originally proposed or amended as necessary with the informal consent of the master's committee). This document is intended to demonstrate the student's ability to perform effective neuroscientific research and prepare the results for publication in a high-quality scientific journal. The format is thus a full publication-quality scientific manuscript presenting the student's results. Since an important goal of the master's process is a research publication, a publication-quality paper will fulfill the written requirement. (Granting of the Master's Degree will be independent of whether the paper is accepted for publication.) This will be a full-length research paper written in the appropriate style of a high-quality peer-reviewed journal. This document need not be in APA format but should be appropriate for submission to a specific, mainstream neuroscience journal of the student's choice (e.g., *Journal of Neuroscience*). Two restrictions apply: 1) if the paper is submitted in a reduced format, such as a brief communication or a Nature report, then a separate, full-length paper would still be required for the Master's Thesis; and 2) the format must be consistent with the requirements of the Graduate School (see "[Style Guide for Thesis and Dissertation Preparation](#)", April, 2004). The latter concerns certain clerical details, rather than content or length, and states that style is to be determined by the student and advisor. In case of a discrepancy between Graduate School and journal requirements, two versions of the same document can be generated.

The Application for the Degree of Master's of Science can be found on the SGS website: <https://gsnb.rutgers.edu/resources/graduate-student-forms>

3. Oral Defense of the Master's Thesis

The master's thesis must be defended in a public presentation before the department as a scientific talk. This may be done individually or as part of the departmental Master's Day talk series. Answering questions from the committee and the audience are a normal part of this process.

The members of the committee will meet privately (usually immediately after the oral defense) to discuss the written thesis and the oral presentation. Feedback from the committee will be communicated directly by the full committee (e.g., by calling the student back into the room after deliberations), through the committee Chair (the student's advisor), and/or through individual meetings as appropriate. The committee may approve the thesis as-is or require revisions to the thesis prior to approval. DEADLINE: Final approval is by vote of the committee members and should be obtained by the end of the 5th semester. **Please note that this requires electronic filing of paperwork with committee members' e-signatures directly to the School of Graduate Studies at. The form for which is found [here](#).** A copy of the finalized Master's Candidacy form, thesis title page and abstract is sent to the Senior Graduate Administrator in the graduate office.

THE QUALIFYING EXAMINATION

1. The Qualifying Examination Committee

The committee will be composed by the advisor and the student and is normally chaired by the advisor. The advisor and student will select a committee of *three faculty members*. One member may come from outside the membership of the Psychology Graduate Faculty, where this reflects the interdisciplinary character of the student's program. Committee membership must be approved by the Area Coordinator, Vice Chair for Graduate Studies, and the Department Chair.

Forms for signatures indicating approval should be obtained from the Psychology Department website: <https://psych.rutgers.edu/academics/graduate/forms-for-grad-students>

2. The Qualifying Examination

The qualifying examination evaluates the student's ability to integrate his or her specialty with broader interests in psychology. Each of the 3 committee members other than the advisor (Chair) will submit 1 or 2 topics (and a reading list), i.e., a total of 3 to 6 topics. These will be presented to the student within 2 weeks of the committee's formation or of its initial meeting. Before receiving the topic/s, it is the student's responsibility to discuss with each committee member potential topics that integrate the student's specialty with concepts from some selected core of behavioral neuroscience, in order to identify the topic/s and reading list.

At the end of 3 months' (maximum) preparation for all topics, the student will take a closed book, sit-down exam consisting of three questions (each committee member submits to the advisor one question or set of questions related to the reading list). The advisor, supported by the Senior Graduate Administrator, will administer the exam by presenting the student with one question per day for 3 consecutive days. A maximum of 4 hours will be allowed to answer each committee member's question(s). The Area Coordinator will monitor the student's progress to ensure completion of the exam on schedule.

3. Grading the Qualifying Examination

Each committee member will grade the student's responses to all questions on the examination as pass/fail. One week will be provided for grading. If the student fails the exam, the retake (a different exam administered by the same committee) will be taken within one month after notification of the failing grade. Students are required to pass the Qualifying Exam in order to advance to Ph.D. Candidacy.

4. Schedule for Initiating the Qualifying Examination Process

The Qualifying process, including the approval of a committee, should be initiated as soon as possible after defending the Master's thesis, and should be completed by the end of the 7th semester. Students admitted with a Master's degree will complete the process no later than the end of the 5th semester.

THE DOCTORAL DISSERTATION

1. The Doctoral Dissertation is expected to be an original empirical study, representing an independent research effort on the part of the student.
2. All research that involves experimental animals must be submitted to and approved by the Rutgers Institutional Animal Care and Use Committee (IACUC) prior to the collection of any data.
3. A formal proposal for the dissertation research must be presented to and approved by the student's committee. A formal meeting of the dissertation committee is required for approval of the proposal, and all members of the committee must approve a written proposal.
4. Procedures and Regulations governing the Doctoral Dissertation:
 - a. **Ph.D. Dissertation Committee**
 - i. *Complete the Dissertation Committee Form. This form may be obtained from the [Department of Psychology website](#).* The completion of the form includes the concurrence and signature (to indicate that concurrence) of the Area Coordinator. You will be notified of the approval of your Committee by the Graduate Director. The form is then filed in the Office of the Vice Chair for Graduate Studies.
 - ii. The Committee consists of four members: A chairperson who must be a member of the Graduate Faculty and two persons who may be either members or associate members of the Graduate Faculty. If less than two members of the committee are Psychology Department faculty, the chair must write a memo explaining why departmental faculty not appropriate, and why selected committee members are appropriate. The fourth member of the Committee must be an "outside" member, defined as: a member or associate member of the Graduate Faculty in a program other than Psychology, or a qualified person from outside Rutgers University. In this case, approval must be obtained from the Graduate Director. Your Committee Chairperson must furnish a paragraph describing the qualification of the outside member, along with a vita and mailing address of the individual. The Dissertation Committee membership can, but need not, overlap with the Master's committee and/or the Qualifying Exam committee.
 - b. **Final Examination**
 - i. It is your responsibility to make sure you have completed the Area course requirements and that you have 48 course credits and 24 research credits for the Ph.D. degree.
 - ii. The date for the final defense must be cleared with the Behavioral & Systems Neuroscience Area Coordinator. Since dissertation orals are public, the Graduate Psychology Office must be notified at least 2 weeks before the scheduled orals (date, time, place, and title of dissertation) so that notices can be sent to faculty and students.
 - iii. Normally, the final draft of the Doctoral Dissertation is prepared by the student with the guidance of his/her advisor and then submitted to the remaining doctoral committee members **at least three weeks** prior to the date of the final defense. Students are allowed one retake of the doctoral defense. The Graduate School allows one dissenting vote on the doctoral defense.

- iv. A booklet entitled "[Thesis Form: Style Guide for Thesis Preparation](#)" is available from the Graduate School, New Brunswick. **You are also required to submit an abstract not exceeding 350 words.**
- v. *Obtain the Final Defense Form (i.e., candidacy application) [from the Graduate School office](#).* Submit to the Chairperson of your Committee. The Chairperson will record the results by e-signing Part II, A or B. It is then your responsibility to have it e-signed properly by your Committee (see below).
- vi. **Return to the Senior Graduate Administrator for processing prior to obtaining the Graduate Director's signature.** Completed forms must be e-filed with the Graduate School office no later than *three weeks before commencement* (i.e., no later than announced deadlines for October and January).
- vii. **After a successful defense, save and return your completed Final Defense Form along with one original title page signed by your committee in PDF format. (It can be one combined PDF or separate)**
 - a. Committee members and program director must sign page two.
 - b. Both course and research credits must be listed on page three.
 - c. Here is a sample [Title Page](#)
- viii. **The instructions for the final submission are found at:** <https://gsnb.rutgers.edu/academics/checklist-phd-degree>
 - a. The final version of the dissertation is uploaded to: <https://etd.libraries.rutgers.edu/login.php>
 - b. The completed submission is submitted to sgs.degree.submissions@grad.rutgers.edu