

**Behavioral and Cognitive Neuroscience Curriculum**  
**Department of Psychology, Wayne State University**

## **General Structure of Curriculum**

The Behavioral and Cognitive Neuroscience Area (BCN) is an interdisciplinary research and research training area within the Department of Psychology. Students are admitted into the Area with an understanding that at least during the first year they are committed to an initial specific lab and Advisor. In addition to the Departmental Core courses, all students are required to take an Area Core sequence of courses in Behavioral and Cognitive Neuroscience that will provide a solid foundation of knowledge in brain and its role in determining and shaping behavior. These courses are necessary for advanced courses that follow in the student's concentration, as well as for their individual research that begins in the first year. Student training will be complemented by Concentration Coursework that is selected in consultation with the Advisor. The Concentration is intended to provide in-depth training tailored to individual research interests across multiple disciplines.

Detailed departmental requirements for completing of the Doctoral degree can be found in the *Wayne State University Psychology Department Graduate Studies Bulletin*, or posted on the departmental web site (<http://www.clas.wayne.edu/Psychology>). Briefly, the general departmental course requirements are:

### **Required Course Credits:**

17	Departmental Core
20	BCN Core Courses (Major)
8	<u>Concentration Courses (Minor)</u>
<b>45</b>	<b><i>Total Required Credits</i></b>

### **Thesis Credits:**

8	PSY 8999 (currently optional)
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### **Research Credits:**

9	PSY 7990 Directed Study (9 credits maximum)
30	Candidate Status (Four consecutive; semesters of 7.5 credits each: PSY9991, PSY9992, PSY9993, PSY9994)

- A minimum of 90 graduate credits is required to complete the Ph.D. program.
- Remaining credits may be coursework, directed study, and/or pre-dissertation research distributed over the major and cognate areas.

## REQUIRED COURSES

### I. Departmental Core

**A. All students must complete the following core courses by the end of their first year:**

1. PSY 7150 Quantitative Methods I (4 credits)
2. PSY 7160 Quantitative Methods II (4 credits)

**B. Students must complete one additional quantitative course by the end of their second year:**

1. PSY 7180 Research Design and Methodology (3 credits)
2. PSY 8150 Multivariate Analysis in Psychology (3 credits)
3. PSY 8740 Seminar in Psychological Measurement and Statistics (3 credits)

**C. Students must complete two of the following courses by the end of their second year:**

1. PSY 7090 Theories of Learning (3 credits)
2. PSY 7010 History & Systems (3 credits)
3. PSY 7080 Human Cognition (3 credits)
4. PSY 7250 Personality (3 credits)
5. PSY 7400 Lifespan Development (3 credits)
6. PSY 7590 I/O Psychology (3 credits)
7. PSY 7620 Social Psychology (3 credits)

### II. Major Area

**A. Major BCN Core Required Courses:**

Course ID	Title	Credits
PSY 8060	Functional Neuroanatomy	3
PSY 8065	Neurophysiology and Neural Plasticity	3
PSY 7140	Cognitive Neuroscience	3
PSY 8560/PYC 7560	Models and Methods in Psychopharmacology	3
	Elective*	3
	Elective*	3
PSY 7991+	Current Topics in Behavioral Neuroscience	1
PSY 7991+	Current Topics in Behavioral Neuroscience	1
<b>Total Required Major BCN Core Credits</b>		<b>20</b>

\* Students should select the elective courses in consultation with their Advisor.

+ These □ credits □ should □ be taken in year 2; See guidelines in Section III.

**B. All students in the BCN program are required to participate actively in PSY 7991- Current Topics in Behavioral Neuroscience.**

PSY 7991 is the BCN Area's "Journal Club" and is the focal point of interaction between students and faculty in the BCN Area. Students must officially enroll in the class twice to satisfy requirements of the BCN Major Core.

**C. Minor Requirements:**

*Students must complete a minimum of 8 credits in Concentration Coursework by selecting three courses with a common theme.*

**Concentration Courses** provide flexibility in individual training by providing educational opportunities in specific areas most relevant to a student's interests and research. Required Concentration coursework will be determined by the student and their Advisor. A partial list of courses from which a concentration can be crafted is below. *Sample curricula* are also illustrated as an example of the kinds of concentrations that may be constructed. Importantly, students are not limited to these; courses can be drawn from both within and outside the department.

### **BCN Concentration Course List**

#### ***Psychology courses***

- PSY 7330 *Clinical Neuropsychology*  
 PSY 7340 *Neuropathology and Behavior*  
 PSY 7480 *Cognition and Emotion Across the Life Span*  
 PSY 8040 *Social Neuroscience*  
 PSY 8080 *Memory and Brain*  
 PSY 8300 *Health Psychology I*  
 PSY 8310 *Health Psychology II*  
 PSY 8440 *Developmental Neuropsychology*  
 PSY 8570 *Clinical Psychopharmacology*  
 PSY 8580 *Substance Abuse (PYC 7580)*  
 PSY 8680 *Seminar in Physiological Psychology*. Rotating topics include:  
     *Neurobiology of Emotion*  
     *Developmental Psychobiology*  
     *Cognitive Aging: A Neuroscience Perspective*  
     *Biopsychology of Eating and Weight Regulation*  
 PSY 8720 *Seminar in Cognitive Processes*  
 PSY 8999 *Master's Thesis Research and Direction*

#### ***Courses outside Psychology***

- ANA 7130 *Neuroanatomy*  
 BIO 7660 *Neurobiology II (Developmental)*  
 PSL 7660 *Neurophysiology*  
 PSL 7730 *Reproductive Sciences: Teratology*  
 PYC 7010 *Molecular Neuropsychopharmacology*  
 PYC 7500 *Advanced Topics in Neuroscience*  
 PYC 7520 *Molecular Biological Approaches in Neurobiology*  
 PYC 7550 *Signal Transduction in Neuronal Tissues*

## Sample Concentration Curricula

*(For illustration only. The student's concentration is determined by the student with their Advisor to best fit a student's specific training needs and interests.)*

### **Psychopharmacology and Substance Abuse**

PYC 7010 *Molecular Neuropsychopharmacology*  
 PSY 8570 *Clinical Psychopharmacology*  
 PSY 8580 *Substance Abuse*

### **Motivated Behaviors**

PSY 8080 *Memory and Brain*  
 PSY 8680 *Neurobiology of Emotion*  
 PSY 8680 *Biopsychology of Eating and Weight Regulation*

### **Lifespan and Cognitive Neuroscience**

PSY 8440 *Developmental Neuropsychology*  
 PSY 7480 *Cognition and Emotion Across the Life Span*  
 PSY 8660 *Cognitive Aging: A Neuroscience Perspective*  
 PSY 7340 *Neuropathology and Behavior*

### **Developmental Psychobiology and Teratology**

PSY 8680 *Developmental Psychobiology or PSY 7401 Developmental Psychobiology*  
 BIO 7660 *Neurobiology II (Developmental)*  
 PSL 7730 *Reproductive Sciences: Teratology*

### **Behavioral and Cellular Mechanisms of Learning**

PSY 8080 *Memory and Brain*  
 PYC 7550 *Signal Transduction in Neuronal Tissues*  
 PSL 7660 *Neurophysiology*

### **Health Psychology**

PSY 8300 *Health Psychology I*  
 PSY 8310 *Health Psychology II*  
 PSY 7300 *Psychopathology or PSY 7330 Clinical Neuropsychology*  
 PSY 7340 *Neuropathology and Behavior*

### **Evolutionary Psychology**

PSY 7401 *Developmental Psychobiology*  
 PSY 7030 *Evolutionary Psychology of the Emotions*  
 PSY 7460 *Developmental Psychology of Adolescence*

### **III. Guidelines for Student Progress**

#### ***Year 1***

##### Fall

PSY 7150 (Department Quantitative)

BCN core

Department breadth (PSY 7090 or other)

\* Current Topics in Behavioral Neuroscience (PSY 7991)

##### Winter

PSY 7160 (Department Quantitative)

BCN core

Department breadth (PSY 7090 or other)

\* Current Topics in Behavioral Neuroscience (PSY 7991)

**\*Important note:** Students should only register for 10 credits per semester. Since the Department quantitative courses are 4 credits each, students cannot formally enroll in PSY 7991 without going over the 10 credit limit. As detailed in Section II. B, students are still expected to attend and participate actively. Required Credits for PSY 7991 are earned in later semesters.

#### ***Year 2***

##### Fall

Department Quantitative

BCN core

BCN core or concentration

Current Topics in Behavioral Neuroscience (PSY 7991)

##### Winter

BCN Core

BCN Concentration

Current Topics in Behavioral Neuroscience (PSY 7991)

***Students should have an approved Master's Thesis proposal by the end of year 1.***

***Students should strive to complete the Master's Thesis or Equivalency Project by the end of year 2.***

#### ***Year 3***

##### Fall

BCN Core

BCN Concentration

Current Topics in Behavioral Neuroscience (PSY 7991)

##### Winter

BCN Core (if necessary)

BCN Concentration

Current Topics in Behavioral Neuroscience (PSY 7991)

***Students should strive to complete the Major Area Paper by the end of year 3. This due date is contingent upon prior completion of the Masters Thesis or Equivalency Project.***

**Years 4 & 5**

Dissertation research credits\*

**\*Dissertation Research Credits Requirement**

Upon approval of the *Recommendation for Doctor of Philosophy Candidacy Status* form (see below), students may begin registering for Candidacy Status. Four consecutive semesters of Candidate Status are required, 7.5 credits each (PSY 9991, PSY 9992, PSY 9993, PSY 9994).

**IV. Masters Thesis or Equivalency Project**

Students may elect the MA thesis option or the Master's Equivalency option. Requirements for completion of the Masters degree can be found on the [Department web site](#).

If the student elects the MA thesis option, the student should begin to prepare for the preliminary defense of their MA thesis Proposal, following the steps outlined below:

1. The student should form a MA thesis committee as soon as possible. This committee must consist of 3 Psychology Faculty members. All Committee members must have graduate faculty status to sit on the committee.
2. The student should prepare and present the MA thesis proposal for approval by their committee. Successful completion of the oral examination of the MA thesis proposal is required to conduct the MA thesis. The *Master's Thesis: Outline and Record of Approval* form should be prepared in advance of the meeting. If all members of the committee indicate approval at the meeting, the adviser will then sign the form. The student must then submit this form along the AIC/HIC approval form(s) (if required) to the Psychology Department Graduate Advisor.

**V. Qualifying Examination**

A cumulative exam must be passed before a student **may** accumulate doctoral dissertation research credits. The exam tests whether students are sufficiently knowledgeable about the theories, issues and content in their chosen field of research. The BCN cumulative exam is fulfilled by writing a comprehensive written review that must meet specific requirements and be written *completely independently*. The goal is for students to demonstrate their ability to organize, integrate, critique and synthesize theoretical and empirical information and to provide their own insights into the shortcomings and future directions of the field. This is a skill that is indispensable in conducting a successful dissertation and ultimately in publishing papers in the academic literature.

To take the written qualifying exam, students **MUST** first have completed all of the following:

1. Successfully defended the Master's Thesis or completed the Masters Equivalency Project before the Qualifying exam sign-up date.
2. Successfully completed all required major coursework.
3. Have an approved Ph.D. "Plan of Work" on file with the Graduate School.

The qualifying examination will consist of two components: (1) A *Major Area Paper (MAP)* consisting of a comprehensive written review and integration of the literature in a specific area of

research; and (2) An oral defense of the MAP.

The qualifying examination is intended to demonstrate the student's ability to assimilate a research area and ideally it may also serve as the basis of the dissertation proposal and form the basis of the introductory chapter of the student's dissertation.

The paper is submitted in standard APA format, and should have the general character of a major review paper. The MAP should review some of the history and significance of the topic, indicate its methodological problems and issues, and describe and evaluate the thrust of current research in the area. The level of work expected for this paper is peer-reviewed publication quality. Students will be strongly encouraged to submit their work for publication. Students should strive to complete the examination by the end of the third year.

The written portion and formal presentation (oral defense) of the MAP should be completed within 12 months from date of the defense of the Master's Thesis or Equivalency Project. For students transferring to Wayne State with a Master's degree, the written portion and formal presentation of the MAP should be completed within 24 months from date of admission.

Detailed procedures:

1. The chair of the MAP committee will be the student's dissertation Advisor.
2. The student will initially meet with the Advisor to discuss and come to agreement concerning the scope of the paper (this may take more than one meeting). These meetings should occur as soon as possible after the successful defense of the Master's Thesis.
3. The MAP committee will be composed of a total of 4 Readers, which includes the student's dissertation Advisor and 3 additional Readers. The student, in consultation with their Advisor, will submit to the BCN Area Chair the names of all 4 Readers invited to join the MAP committee. It is recommended that one outside Reader (i.e., from a different area, department, or university) be included on the MAP committee. All Readers must be members of the graduate faculty. If the outside Reader is from another university, then their credentials must be reviewed by the graduate office for the purpose of conferring graduate faculty status.
4. Once the committee has been formed, the student will schedule a meeting with the members of the committee to obtain their initial input on the scope of the paper (share abstract and outline). The student will also verify that the projected timeline is acceptable to all committee members (this is especially important if their input is needed during the summer or over a break).
5. Based on initial feedback from committee members, the student will prepare a 300-word abstract and a detailed outline and submit this electronically to the examination committee members (Readers), the Graduate Advisor, the Associate Chair, and the chair of the BCN area. Once approved, the student, along with the examination committee members (Readers), and the Graduate Advisor will sign the approval form. The student will then formally begin writing the paper. The student has 12 weeks (3 months) to complete the paper from the time the MAP abstract and outline are approved by the Advisor and committee (it is understood that the initial "working" abstract and the final abstract (submitted with the MAP) may be different). Students must submit their paper by the deadline or they will receive a failing grade. The paper is to be turned in electronically to the Psychology Graduate Office ([aallen@wayne.edu](mailto:aallen@wayne.edu)) no later than

5:00pm on the due date. Any circumstance that prevents completion of the exam on time will be addressed on an individual basis as are all missed exams, according to University and Department policy. Students should plan carefully to make sure they devote themselves to writing during the 12-week exam period.

6. While the faculty Advisor is allowed to assist the student in identifying the relevant literature(s) and in producing an initial outline of the MAP, after the initial outline is generated, **the student is not allowed to have any further assistance in completing the MAP.** It is understood that writing of the MAP and the critical analysis within the MAP are the work of the student. **Getting any type of assistance in completing the MAP will be considered cheating with the appropriate consequences (for more information on cheating see <http://www.doso.wayne.edu/judicial/academic-integrity.htm>).**
7. Once the student has completed the written portion of the MAP, the student will submit the MAP to the Department Graduate Student Officer, who will distribute the MAP to the Committee members/Readers.
8. Committee members/Readers will submit a grade to the Graduate Advisor **only within two (2) weeks of receiving the written portion of the MAP.** The MAP is to be scored 'Pass/Fail.' The majority of Readers must score the MAP with a 'Pass' for the MAP to be approved. In a case where there is no consensus (2 Pass & 2 Fail grades) the BCN Area Chair will assign a fifth reader who will submit a grade to the Graduate Advisor **only within two (2) weeks of receiving the written portion of the MAP.** Failure in the written component of the MAP will lead to remediation steps (see below).
9. Upon approval of the MAP by the Readers, the student may schedule the oral presentation component of the examination, in which the MAP is presented to the committee members and discussed. The BCN Area Chair will serve as a non-voting moderator of the oral presentation and discussion. Another faculty member who is not on the MAP committee may serve as moderator if the Area Chair is a MAP committee member. The moderator may ask the student questions but only after the committee members have deliberated and made their decision about whether the student has passed the exam. The oral portion must be conducted within 30 days of passing the written MAP requirement. If a mutually agreed upon date is not feasible for attendance by all committee members, then the oral defense will take place on the first available date.
10. Immediately following the formal oral presentation, MAP committee members will vote on acceptance. **Committee members will submit a grade on the oral presentation to the Graduate Advisor within 24 hours of the oral presentation. Grades are not to be communicated to other committee members or the student.** A student may be passed in the formal presentation if there is not more than one negative vote. Failure of the formal presentation will lead to remediation of this portion of the examination only (see below).
11. Upon successful defense of the MAP, the student is encouraged to present their work at a "Brown Bag" seminar the following semester. This presentation should be no longer than 30 minutes so that there is plenty of time for questions from students and faculty in attendance. Finally, after successfully defended the MAP, the student is also encouraged with the help of their advisor to prepare the MAP for submission as a review article.

**Evaluation Criteria**

- a. While there is no preset page length, the paper must conform to the following requirements: text should be double-spaced, in standard 12-point font with one-inch margins, and follow APA style.
- b. The MAP should consist of a thorough review and integration of the relevant literature(s).
- c. The MAP should consist of critical analyses that identify the shortcomings or weaknesses in the current literature and/or logical next steps indicated by the current literature.
- d. The MAP should demonstrate a thorough understanding of the fundamental principles of psychology and other relevant disciplines (e.g., neurobiology, psychopharmacology, neuroanatomy, and cognitive neuroscience) that are addressed in the MAP.
- e. The MAP should contain proposals for experiments and/or theoretical formulations that address shortcomings in the current literature, and/or logically advance understanding based on the current literature.
- f. The level of writing and reasoning should be consistent with the standards of the leading journals in the areas covered. (The student will have discussed with the Advisor and committee members during the initial formulation of the MAP scope and outline which journals those may be).
- g. The reason why the chosen topic is significant should be clearly described and the paper must reflect a high level of mastery of the central concepts of the topic.
- h. The paper must reflect a high level of mastery of the key methodological issues central to the student's chosen topic. It is important to take the quality of existing research into account when discussing past research.
- i. It is not sufficient to simply summarize existing research. The student must integrate, critically evaluate and synthesize the different theoretical perspectives and articulate conclusions that demonstrate an excellent understanding of the student's chosen topic.
- j. The oral presentation should be approximately 30 minutes. The presentation should demonstrate the mastery of the central concepts of the student's chosen topic and consist of a summary of the written portion of the MAP, taking into account past research (and data), articulation of conclusions from this data, as well as proposals for experiments and/or theoretical formulations that address shortcomings in the current literature and/or logically advance understanding based on the current literature.

**Re-examination:**

Should re-examination of the written or oral presentation portions of the MAP be necessary, the MAP committee chair (i.e., student Advisor) will collect summary statements from each of the MAP Readers (or committee members in case of failure of the MAP formal presentation) and create an executive summary of the MAP weaknesses **within two (2) weeks of the written or oral presentation portions of the examination**. A typical "revise and resubmit" editorial action letter from a grant study section or peer-reviewed journal should serve as a model for such a summary. The summary statement will be given to the student and distributed to the MAP committee members.

Procedures and regulations will follow those prescribed by the Wayne State University Graduate School, and can be found in the current version of the Graduate Bulletin (<http://www.bulletins.wayne.edu>). Relevant current information is provided below (source: Graduate Bulletin, 2002-2004).

“If the written component of the qualifying examination is not completed successfully at the first administration, the examination may be repeated only once. A second examination may not be held until at least one semester has elapsed, but must be held within one calendar year following the first examination. The same examining committee must preside over both examinations. The second written examination will be considered final.”

## **VI. Dissertation Proposal**

After passing the Qualifying Examination the student should begin to prepare for the preliminary defense of their Dissertation Proposal, following the steps outlined below:

1. The student should form a dissertation committee as soon as possible. This committee must consist of 3 Psychology Faculty members and 1 extra-departmental Faculty member. All Committee members must have graduate faculty status to sit on the committee.
2. The student should complete the ***Recommendation for Doctor of Philosophy Candidacy Status*** form. Upon approval of this form, the student may enroll for Candidacy Status credits (i.e. dissertation research credits).
3. The student should prepare and present the dissertation proposal for approval by their committee. Successful completion of the oral examination of the dissertation proposal is required for PhD candidacy. Upon approval, the committee will sign the ***Doctoral Dissertation: Prospectus and Record of Approval*** form which should be prepared in advance of the meeting. At the meeting all members of the committee must sign this form indicating approval. The student must then submit this form along the AIC/HIC approval form(s) (if required) to the Psychology Department Graduate Advisor.
4. ***Dissertation Proposal***. Guidelines for completing the dissertation can be found on the [Department web site](#).

## **Primary Faculty and Interests**

George S. Borszcz, Associate Professor  
Department of Psychology  
Ph.D. Dartmouth College, 1987  
Interests: The neurobiology of learning and emotion.

Scott E. Bowen, Associate Professor (BCN Chair)  
Department of Psychology, Department of Obstetrics & Gynecology  
Ph.D., University of Mississippi, 1993  
Interests: Behavioral pharmacology, toxicology and teratology of abused drugs.

Thomas M. Fischer, Associate Professor  
Department of Psychology  
Ph.D., University of California, Riverside, 1990  
Interests: Synaptic plasticity, cellular mechanisms of learning and behavior, development of neural networks.

John H. Hannigan, Professor  
Merrill Palmer Skillman Institute, Department of Obstetrics & Gynecology, Department of Psychology  
Ph.D., Binghamton University - SUNY, 1983  
Interests: Neurobehavioral effects of prenatal drug and alcohol exposure.

Scott Moffat, Associate Professor  
Institute of Gerontology, Department of Psychology  
Ph.D., University of Western Ontario, 1998  
Interests: Cognitive, structural and functional brain changes associated with aging.

Noa Ofen, Assistant Professor  
Institute of Gerontology, Merrill Palmer Skillman, Department of Pediatrics  
Ph.D, Weizmann Institute of Science, 2004  
Interests: Cognitive and Brain Development across the life span, Human Memory, Functional and Structural Neuroimaging, Developmental Psychopathology.

Ty Partridge, Associate Professor  
Department of Psychology (CDS Area)  
Ph.D. Wichita State University, 1998  
Interests: Biology-behavioral relationships, developmental systems theory

Naftali Raz, Professor  
Institute of Gerontology, Department of Psychology  
Ph.D., University of Texas at Austin, 1985  
Interests: Neural correlates of cognitive aging; Vascular risk and vascular disease as modifiers of cognitive aging; Genetics of age-sensitive cognitive skills; Noninvasive neuroimaging.

Moriah E. Thomason, Assistant Professor  
Merrill Palmer Skillman Institute, Department of Pediatrics  
Ph.D., Stanford University - 2006  
Interests: Development of neural networks in the human brain, emotional development.

Michelle Tomaszycski, Assistant Professor  
Department of Psychology  
Ph.D., Emory University, 2002  
Interests: Integrative, focusing on the neurobiological mechanisms of social relationships using songbirds as a model.