

**Requirements for Graduate Students in the Vanderbilt
Psychological Sciences Program**

August 2009

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Requirements for Graduate Students in the Vanderbilt Psychological Sciences Program

I. Overview

This handbook outlines the requirements for graduate students in Psychological Sciences at Vanderbilt. Discussed are course requirements, milestones (e.g., the qualifying exam), and several additional issues related to the rights and responsibilities of graduate students. The development of an integrated program is an evolving process. Thus, this document will be periodically updated, based on changes that are approved by a vote of the Psychological Sciences faculty. It is the responsibility of the Directors of Graduate Study in the two departments to incorporate such changes into revisions of this document and to inform students and faculty about such revisions.

The requirements described in this handbook are applicable to all students who entered the Psychological Sciences program as first-year students in fall 2004 or subsequent years.

II. Areas of Specialization

Faculty members and graduate students are each associated with at least one of five areas of specialization (denoted as programs or areas in the sections below): Clinical Science, Cognition and Cognitive Neuroscience, Developmental Science, Neuroscience, and Quantitative Methods and Evaluation.

Faculty members from the Departments of Psychology and Psychology and Human Development can contribute to multiple programs. Graduate students are admitted to a specific college, department, and program. Typically, they receive financial support from their home department and college. A common set of core requirements applies regardless of departmental affiliation. Students must meet the requirements both for the graduate program in Psychological Sciences as a whole and for the specific area to which they belong.

III. Accreditation

The Clinical Science programs in the Department of Psychology and the Department of Psychology and Human Development have, in the past, each been fully accredited and approved by the American Psychological Association.¹ Both programs will be reviewed for re-accreditation during the 2004-2005 academic year. In anticipation of that review, one application for re-accreditation will be submitted for the integrated Clinical Science program that encompasses both departments.

¹ Office of Program Consultation and Accreditation, American Psychological Association, 750 First Street NE, Washington, DC 20002-4242; phone: (202) 336-5500; website: <http://www.apa.org/ed/accreditation>

Vanderbilt University is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools. Vanderbilt is a member of the Association of American Universities.

IV. Training Objectives and Mechanisms

The primary objective of graduate training is to promote the development of the necessary conceptual and methodological skills that will allow our graduates to function as independent scientists who conduct innovative and important research. Consistent with this goal, we expect our graduate students to be continually involved in research throughout their graduate training and to develop credentials that will establish a firm foundation for long-term contributions to the field.

Although a variety of means are used to promote the attainment of this objective, two distinctive mechanisms are particularly important. First, we expose students to a diverse array of experiences representative of the demands and challenges that they will confront in post-doctoral and employment settings. For example, we expect our students to be actively involved in research, the publication of articles, and the submission of grant proposals. Second, we use a one-on-one mentoring model of advisement (sometimes termed the "apprenticeship model") as a primary, though not exclusive, vehicle for the training of students. This model specifies that a critical component of training is the relationship between a student and a faculty mentor who is committed to that student's training and who works intensively and collaboratively with that student over time. The mentoring model is reflected in all phases of a student's education, from admissions through completion of the doctoral dissertation. Although the majority of students continue with one primary advisor throughout their tenure in the program, students can, and do, change advisors as their research interests evolve over time.

The majority of our graduates will accept post-doctoral positions that involve some degree of teaching. For this reason, an additional goal is training students how to teach effectively. Towards this end, the majority of our students serve as a teaching assistant at some point during their graduate careers.

V. Financial Support

All students receive financial support. Several mechanisms of support are used, including service-free fellowships provided by Vanderbilt University, research assistantships on funded research projects, fellowships provided by training grants, and teaching assistantships. Supported students receive a monetary stipend, tuition remission, and health benefits. All financial support is contingent on the student's continuance in good standing. At the present time, all students in good standing are guaranteed financial support during their first five years of training. The great majority of students have been supported throughout their graduate tenure.

Students are generally encouraged to submit a grant proposal to help support their research at some point during their residence in our program. This could be a federal grant or a private foundation grant. In addition, small grants to support research by graduate students are available from Vanderbilt University. Students can also apply for funds to facilitate travel and attendance at conferences or other scientific meetings. Additional details about such funds are available from the Directors of Graduate Studies and the staff members who serve as their primary assistants.

VI. General Requirements

A. Course Requirements

The annual Graduate School Bulletin contains the complete list of graduate courses in psychology. Those specific courses that are taught in a given year are listed in the Schedule of Courses that is circulated prior to each semester. At the present time, classes are listed separately by department (Psychology or Psychology and Human Development) in both sources, with the location of the listing determined by the home department of the instructor. When specific courses are indicated below, we will note both the course number and the department in which it is currently taught (A&S = Arts & Sciences Psychology; P = Peabody Psychology and Human Development). It is likely that, in the future, all Psychology courses will be listed together under the rubric of Psychological Sciences.

Grades in courses that are less than a C (C- or below) are considered failing. Grades of B- or below are considered cause for concern. A student must attain a grade of C or better in order to receive credit for fulfillment of the requirements below, although instructors may impose a higher minimal threshold in specific cases. All students enrolled in a given class will be explicitly informed about the minimal grade required for satisfactory completion of that class.

The course requirements applicable to all graduate students irrespective of area of specialization are as follows:

1. **Statistics:** The two courses that make up the first-year statistics sequence (6 credits). In the fall, either 304A-A&S (Quantitative Methods and Experimental Design) or 310-P (Statistical Inference) is required. In the spring, either 304B-A&S (Quantitative Methods and Experimental Design) or 311-P (Experimental Design) is required. During the past several years, the specific sequence has been 310-P and 304B-A & S. In rare cases, based on a diagnostic test given at the beginning of the fall semester, a first-year student may be advised to enroll in Psychology 309-P (Introduction to Statistical Inference), an introductory statistics class designed for students who lack an appropriate undergraduate background in statistics. Once 309-P is satisfactorily completed, the student is expected to fulfill the introductory sequence (e.g., 310-P/304B-A&S) noted above.

2. **Research Seminar:** A research seminar (300A–A&S [Research Seminar] for A&S students, 396-P [Seminar in Psychology] for Peabody students) taken in the fall semester of the first year. This seminar meets once per week. Core competencies of a successful scientist include scientific knowledge, research skills, communication skills, teaching, professionalism, and responsible conduct of research. This course will provide part of your introduction to each of these core competencies that will further develop as you progress through your graduate and postdoctoral training.
3. **Breadth Requirement:** One course from three of the areas of specialization listed below (9 credits total). Appendix A lists the specific courses offered in each area of specialization that can be used to fulfill this requirement. Although some courses are listed under more than one area of specialization, a given student can only count a given class within one category. Furthermore, a course that fulfills a specific area group requirement in the student's particular research area cannot also be used to satisfy the breadth requirement in a different area (e.g., Cognitive Neuroscience can be used to satisfy the core requirement in the Neuroscience area but it cannot also be used as a course from the Cognition and Cognitive Neuroscience area to satisfy the breadth requirement as well).
 - a. Clinical Psychology
 - b. Cognition and Cognitive Neuroscience
 - c. Developmental Psychology
 - d. Neuroscience/Physiological Psychology
 - e. Perception
 - f. Personality and Individual Differences
 - g. Quantitative Methods and Evaluation
 - h. Social Psychology

Specific area groups may require further coursework in addition to those required at the departmental level. See below for a description of the additional requirements in specific area groups.

B. Research Requirements and Milestones

As described above (see Section IV), the scientific training of our graduate students is the highest priority. Accordingly, we expect all graduate students to be continually involved in research during their tenure at Vanderbilt. As graduate students progress through the program, we expect to see increasing levels of research productivity and increasing levels of intellectual independence. Research productivity is demonstrated by completing research projects, presenting at conferences, publishing papers, and applying for grants. Intellectual independence is demonstrated by developing a command of the relevant literature, formulating new ideas for experiments and analyses, and theoretically integrating empirical findings in novel ways.

In addition, there are several research requirements and milestones that serve to promote students' development as scientists and to facilitate evaluation of progress. Specifically, all area groups: (1) evaluate students' research progress and relevant

knowledge of the field during their initial years in the program; (2) require students to pass qualifying exams in order to advance to doctoral candidacy; and, (3) require students to complete satisfactorily a doctoral dissertation in order for receipt of the Ph.D degree. The specific nature and timing of these milestones (particularly the first two noted above) vary somewhat across area groups. Therefore, research requirements and milestones are described in the sections below that focus upon specific area groups.

Above and beyond these general milestones, the graduate student's committee, in consultation with the relevant AGD and DGS, can specify specific milestones that the graduate student must meet.

NOTE: Many of these milestones are capped off by an oral defense meeting. Graduate students should try to avoid scheduling evaluation meetings during the first and second year, qualifying exam meetings, and doctoral dissertation defense meetings during summer months.

C. Credits and Registration

Students should be aware of Vanderbilt University requirements that are applicable to all graduate students. Specifically, receipt of the Ph.D. requires at least 3 years of academic graduate study, and completion of 72 hours of graduate work for credit with a minimum of 24 hours in formal course and seminar work. Generally, this minimum 24 hours does not include research or reading credits (e.g., Psychology 369, 379, and 399 in both departments), clinical practicum credits, or area colloquia (e.g., Seminar in Cognition and Cognitive Neuroscience, Seminar in Clinical Science, Seminar in Neuroscience). See the Bulletin of the Vanderbilt University Graduate School for additional details.

Students in the Department of Psychology (Arts & Science) are required to register for 12 credit hours per semester until they have completed the required 72 credit hours of graduate work. In the majority of cases (i.e., students who do not transfer credits from another institution), to fulfill this requirement A&S psychology students register for 12 credit hours per semester for the first three years of graduate study. Each semester, students typically should register for 3 or more hours of research credit. First year graduate students should register for Psychology 331a or 331b (Advanced Investigational Techniques). More advanced students who have not yet passed their qualifying examination (the MAP) should register for Psychology 369 or 379. Students should enroll in Psychology 369 (Master's Thesis Research) if they have not yet reached their 72 credit hour limit and have not yet passed their qualifying exam (the MAP). Students should enroll in Psychology 379 if they have reached their 72 credit hour limit but have not yet passed their qualifying exam (the MAP). Students who have passed their qualifying exam (the MAP) should register for Psychology 399 (Ph.D. Dissertation Research). When students have completed the required 72 hours, they should register for 0 credit hours of 379 or 399 (as appropriate) until the dissertation is successfully defended. Students should register for the minimal number of hours needed to exactly reach 72 hours when they arrive at that point in their program.

Students in the Department of Psychology and Human Development are required to register for 9 credit hours per semester until they have completed the required 72 credit hours of graduate work. In the majority of cases (i.e., students who do not transfer credits from another institution), to fulfill this requirement students in Psychology and Human Development register for 9 credit hours per semester for the first four years of graduate study. When such students have completed the required 72 hours, they typically register for 0 credit hours.

Students who come to Vanderbilt with prior graduate experience at other institutions may be allowed to transfer graduate course credits in order to meet program, department, or university requirements. Such transfers require approval by the current instructor of the course and by the Director of Graduate Studies of the student's home department. In order to facilitate decisions about credit transfers, students should present as much documentation as possible about courses taken elsewhere (e.g., course syllabi, examinations). Approved transfer credits will count toward the 72 hours of total graduate credits required, and in rare cases one or two courses may also count toward the required 24 hours of formal course and seminar work.

VII. Course and Research Requirements in Specific Area Groups

A. Clinical Science Area

The Clinical Science program offers doctoral education and training in clinical psychology. The primary mission of the program is to educate clinical scientist-practitioners who have the ability to make important, innovative contributions to scientific knowledge and the ability to function as skilled clinicians who use empirically validated assessment methods and treatment modalities. In addition to these core requirements common to all students, the program has sufficient flexibility to allow students to concentrate their training and to develop specialized expertise in given areas that draw on the strengths of our faculty and the opportunities for research and clinical training. Areas in which students can focus their training include psychopathology (including developmental psychopathology, adult psychopathology, developmental disabilities), clinical neuroscience, basic emotion processes, prevention and intervention, health psychology, and quantitative analysis.

A.1. Course Requirements

In addition to meeting all general course requirements applicable to all graduate students in Psychological Sciences, Clinical students must pass the following courses. These courses will typically be taken during the first two to three years of graduate study:

1. Psychopathology (340-P)
2. Research Methods in Clinical Psychology (310-A&S)
3. Psychological Measurement (317-P)
4. Assessment
 - a. Students must pass two of the following three courses:
 - i. Cognitive Assessment (343-P)
 - ii. Personality Assessment (312-A&S)

- iii. Neuropsychological Assessment (354-A&S)
- 5. Theories of Psychotherapy (315-A&S)
- 6. Ethics and Cultural Diversity (353-A&S)
- 7. Two additional classes in the following areas:
 - a. Students must take two of the following three:
 - i. An additional Psychopathology course
 - ii. An additional Intervention course
 - iii. An additional Assessment course
- 8. To fulfill APA distribution requirements, students must pass at least one course covering the current body of knowledge in each of the following areas, and demonstrate competence in each area by successful completion of the targeted course(s). Appendix B lists the specific classes that can be used to meet the requirements in each area.
 - a. Biological aspects of behavior
 - b. Cognitive and affective aspects of behavior
 - c. Human development
 - d. Social aspects of behavior
 - e. Individual differences in behavior
 - f. History and systems.

Additional APA distribution requirements for psychological measurement, research methodology, techniques of data analysis, psychopathology, and professional standards and ethics are met through courses that are required by the Psychological Sciences program and/or the Clinical Science area group. APA distribution courses can also be used to fulfill departmental requirements.

- 9. All Clinical students must complete either four semesters of 360 (A&S) (Seminar in Clinical Science, two semesters (not necessarily consecutive) of 349-P (Seminar in Developmental Psychopathology), or two semesters (not necessarily consecutive) of 349P (Seminar in Intervention Research) during their graduate training.

A.3. Practicum Requirements

All clinical students must successfully complete four semesters of supervised practicum experience. A pre-practicum experience during which students can gain initial exposure to clinical settings begins in the spring of the second year. The full practicum experience typically begins during the third year in residence but can begin during the summer after the second year. Many students opt to pursue additional experiences during summers and/or in year 5. It is expected that students will be engaged in practicum for 12 hours per week during the semester. Students are expected to receive two semesters of experience in both the areas of psychological assessment and intervention during the course of their practicum training. Typically, specific practica focus on either assessment or intervention, although several combine training in both components. Ideally, students should receive training in both in-patient and out-patient settings.

A maximum of six credit hours from any one training site may be applied toward meeting practicum requirements. Practicum credit will be awarded only for practica completed at agencies approved by the Co-Directors of Clinical Training. Additional

information concerning practicum requirements and procedures is available in the *Practicum Handbook *B*: Practica Requirements and Procedures for Clinical Psychology*. Descriptions of the specific practicum sites are available in the brochure titled *Practicum Handbook *A*: Clinical Psychology Practicum Sites*.

Clinical students in the A & S Psychology Department who are receiving practicum training must enroll in (a) Year 3: either 323-A&S (Assessment) or 324-A&S (Psychotherapy); and, (b) Year 4: either 325-A&S (Advanced Assessment) or 326-A&S (Advanced Psychotherapy). Clinical students in the Department of Psychology and Human Development who are receiving practicum training must enroll in either 390-P or 391-P.

A.4. Annual Review

At the conclusion of the spring semester the clinical training faculty meet to evaluate the progress of each student in the program. All facets of a student's training are considered. Individual faculty advisors then complete an Annual Evaluation Form that summarizes the student's progress. Advisors then meet individually with each advisee to review the form and accompanying feedback.

Students who have advanced to doctoral candidacy (i.e., successfully completed the Qualifying Exam) are required to submit a curriculum vita and brief (i.e., one page) progress report detailing their accomplishments over the past year and plans for the next year.

A.5. Research Requirements (Years 1-3)

It is expected that: (1) students will conduct at least one empirical research project prior to reaching Ph.D. candidacy; (2) this project will culminate in a manuscript that can be submitted for publication; and, (3) the project will preferably be completed no later than the beginning of the third year. The student's primary advisor will be the principal supervisor of the project. The committee reviewing the empirical project will consist of the primary advisor and at least one additional faculty member, but two additional faculty members are encouraged for faculty and students preferring that option.

Students will submit their final manuscript to their committee for review. In consultation with their advisor, students can choose either: (1) to meet with the advisor and the other faculty member(s) to discuss the paper; or, (2) to receive detailed written feedback about the manuscript from the other faculty member(s). In both cases, members of the committee will complete a Research Evaluation form. The primary advisor will provide feedback to the student concerning the evaluations. Students are encouraged to discuss their manuscript and the evaluations with the other member(s) of their committee.

Students also will have the opportunity to present their work during clinical science seminar meetings, developmental psychopathology pro-seminar, and/or the intervention research pro-seminar. In addition, students are strongly encouraged to present their work at professional conferences and are expected to submit their work for publication.

A.6. Qualifying Examination

As described in the Graduate School Bulletin, the purpose of the qualifying (i.e., preliminary) examination is to evaluate the student's knowledge of the field of specialization, to assess familiarity with the published literature, and to determine whether the student possesses the skills necessary to be advanced to doctoral candidacy and to succeed in a scholarly career.

In the Clinical Science program, the written product that constitutes the basis for the qualifying exam can take one of two forms:

1. A Major Area Paper (MAP) that is an integrative review of an area of study that typically has been the focus of the student's research for the past several years. It should have the scope and length of review articles that appear in Psychological Bulletin; or,
2. A written examination consisting of responses to a set of questions that are designed to assess the student's breadth of knowledge across multiple areas of clinical psychology (e.g., psychopathology, assessment, intervention, research methodology, and ethics).

Regardless of form of the written component, a Qualifying Committee will evaluate the qualifying exam. The Qualifying Committee consists of at least four members of the Graduate Faculty of Vanderbilt University with at least three members from the from the Vanderbilt Psychological Sciences faculty and at least one faculty member from outside the home department (i.e., another Vanderbilt Department such as the Department of Psychiatry at the Vanderbilt Medical School). Faculty members from other universities can serve on Qualifying Committees but cannot substitute for an outside the department representative from the Graduate Faculty of Vanderbilt. In forming a Qualifying Committee, students should consult with their advisors and the two should mutually decide upon a set of faculty members who would be appropriate for the committee. The student should then submit this set of recommendations to the Director of Graduate Studies of the home department. Following any discussions that may be necessary with the student, the Director of Graduate Studies will make recommendations to the Dean of the Graduate School for the formal appointment of the Qualifying Committee. The Qualifying Committee will also typically serve as the Dissertation Committee, although this is not a formal requirement.

The qualifying examination must be held no later than May 31 of the fourth year, and no later than May 31 prior to the fall semester during which a student intends to apply for internship. For that examination, the student will meet with the Qualifying Committee. One focus of the meeting will be the written product with additional foci introduced at the discretion of the committee. At the end of the meeting, the committee, in executive session, will vote on the performance of the candidate. The possible options are: (1) pass, which means that the student is advanced to doctoral candidacy and is allowed to prepare a dissertation proposal; (2) conditional pass, which means that the student must undertake some specific additional work before a pass can be recommended; (3) failure, either with the option of reexamination, or without (with the latter option meaning termination from the

program). Failure to pass the qualifying examination after three tries will result in termination from the program.

A.7. Dissertation Proposal and Dissertation

Clinical students must follow the guidelines for dissertation proposal meetings and final orals outlined in Section IX below. Clinical students must have a dissertation proposal approved on or before October 15 of the fall semester during which they intend to apply for internship.

A.8. Clinical Internship

All clinical students are expected to complete successfully an APA approved clinical psychology internship. In rare cases, a student may attend a non-APA internship if it is in the student's best interest. There are several requirements for internship eligibility. First, students may not go on internship until: (a) they have met all of the course and practicum requirements of the department and the clinical area; and, (b) the clinical faculty has agreed that the student is academically and personally ready to apply for internship. Second, as noted above: (a) students must have completed their qualifying exam by May 31 of the year during which they intend to apply for internship; and (b) students must have a dissertation proposal approved on or before October 15 of the year during which they intend to apply for internship. Both requirements presume that students apply for internship during the fall semester of a given year.

B. Cognition and Cognitive Neuroscience Area

Graduate students in the Cognition and Cognitive Neuroscience program become active in research during their first semester in the program and are required to engage in collaborative research throughout the degree program. Course work includes introductory survey courses, specialized didactic courses, advanced seminars, and methods courses. Students also receive strong training in professional speaking and writing by way of semester research reports and colloquia.

B.1. Course Requirements

The Cognition and Cognitive Neuroscience area group requires participation in a weekly seminar (357-A&S) that primarily involves presentations by faculty, students, and guests. Students formally register for this seminar during the second and third years. In the first year, students audit this seminar.

B.2. Research Requirements during the First Two Years

Students are expected to complete a research project in each of the first two years. An Advisory Committee consisting of three faculty members from Psychological Sciences will evaluate students' research progress and provide feedback about research. The advisor will serve as chair of the Advisory Committee. Meetings with the Advisory Committee must occur by May 31 of each of the first two years. At least one week before the meeting, students will provide committee members with written evidence of research productivity. Such evidence may consist of papers describing completed research projects or papers ready for submission to journals or conferences. During the meeting, the Advisory Committee will discuss the presentation and written report with the student. At

the end of each meeting, the members of the Advisory Committee will meet without the student present to evaluate the student's progress. Following each meeting, the advisor will provide feedback to the student concerning the evaluations.

At the end of the first year, all students will give a brief public presentation of their research at the annual first-year research presentations scheduled for early to mid May. Second year students are expected to present their research at one of the CCN Friday seminars (either the fall or spring semester of the second year).

All students in the CCN program are expected to complete a graduate fellowship application in their first year. If they are eligible for funding from an agency, their advisor will determine whether the application should be submitted for review. For U.S. students, this will be an NSF graduate fellowship or an NRSA predoctoral fellowship from the NIH. For Canadian students, this will be an NSERC. For students from other countries, the advisor, area heads, and Director of Graduate Studies will attempt to find other possible sources for fellowship funding.

B.3. Qualifying Examination

As described in the Graduate School Bulletin, the purpose of the qualifying (i.e., preliminary) examination is to evaluate the student's knowledge of the field of specialization, to assess familiarity with the published literature, and to determine whether the student possesses the skills necessary to be advanced to doctoral candidacy and to succeed in a scholarly career.

A Qualifying Committee will evaluate the qualifying exam. The Qualifying Committee consists of at least four members of the Graduate Faculty of Vanderbilt University with at least three members within the student's home department (A & S Psychology or P & HD) and at least one faculty member from outside the home department (i.e., either from the other Psychology Department or another Vanderbilt Department such as the Department of Computer Science). When the outside-the-department member is from the other Psychology Department (e.g., the Department of Psychology and Human Development in the case of an Arts & Science student), that individual should have a primary affiliation with an area group other than Cognition and Cognitive Neuroscience. If the student has a minor concentration, one member of the committee should be from the minor area.

Faculty members from other universities can serve on Qualifying Committees. If they are a fifth committee member, they can simply be added to the committee. But if this person is intended to count as the person from outside the home department, then the committee nomination form must be accompanied by the following: (1) A letter from the student's primary advisor that clearly states why this outside committee member has unique expertise that contributes a unique perspective on the student's work, (2) a description of how this outside committee member will contribute to the student's training above and beyond simply calling into the qualifying examination and dissertation meetings, and (3) a curriculum vitae of the outside committee member. It probably goes without saying that the outside committee member must have academic credentials

comparable to that of faculty at Vanderbilt. But just as important, there must be mechanisms in place that allow the graduate student to have meaningful interactions with the outside committee member apart from committee meetings – the most obvious mechanism would be an active collaboration, but other mechanisms are possible as well.

In forming a Qualifying Committee, students should consult with their advisors and the two should mutually decide upon a set of faculty members who would be appropriate for the committee.

The student should then submit this set of recommendations to the Director of Graduate Studies of the home department. Following any discussions that may be necessary with the student, the Director of Graduate Studies will make recommendations to the Dean of the Graduate School for the formal appointment of the Qualifying Committee. The Qualifying Committee will also typically serve as the Dissertation Committee, although this is not a formal requirement.

Students will be required to submit a reading list and a list of issues to be addressed in the qualifying examination by the end of the fall semester of their third year. This list will be generated by the student and approved by each member of the Qualifying Committee. Committee members can add or delete readings from the list and, more generally, will have input on the list of issues to be addressed.

The written component of the qualifying examination will consist of either:

- (1) A Major Area Paper (MAP) that is an integrative review of an area of study that typically has been the focus of the student's research for the past several years. It should have the scope and length of review articles that appear in Psychological Bulletin; or,
- (2) A written examination consisting of responses to a set of questions that are designed to assess the student's knowledge of the issues that have been previously approved by the Committee.

The Qualifying Committee will determine whether a MAP or written examination is more appropriate for the particular student. The qualifying examination itself will consist of the written component plus an oral examination on the written component and the readings and issues previously agreed upon. The qualifying examination should be held no later than of the end of the third year.

At the end of the qualifying examination meeting, the committee will vote on the performance of the candidate. The possible options are: (1) pass, which means that the student is advanced to doctoral candidacy and allowed to prepare a dissertation proposal; (2) conditional pass, which means that the student must undertake some specific additional work before a pass can be recommended; (3) failure, either with the option of re-examination, or without (in the latter case, the student will be terminated from the program). Failure to pass the qualifying examination after three tries will result in termination from the program.

After the first two years in the program, students are expected to maintain an active, self-motivated research program. In addition to the qualifying examination described above, research achievement (as evidenced by published papers in peer-reviewed journals, presentations at national conferences, and book chapters) will be central to continued success and good standing in the program.

B.4. Dissertation Proposal and Dissertation

Students must follow the guidelines for dissertation proposal meetings and final orals outlined in Section IX below.

C. Developmental Science Area

The Developmental Science program offers students a program of studies that provides a balance between specific course requirements and participation in research. In doing so, the program encourages student participation in research laboratories supplements formal course work. A strength of the program is built-in flexibility that allows students and advisors to plan a sequence of course work that is most fitting to a particular student's intellectual needs and interests. Many of the required courses fulfill departmental requirements, as well.

C.1. Course Requirements

In addition to meeting all general course requirements applicable to all graduate students, students in the Developmental Science program must earn a grade of B- or above the following courses. These courses can also be used to fulfill general course requirements.

1. Developmental Psychology (360-P)
2. One course in cognitive development, to be selected from the following:
 - a. Seminar in Cognitive Development (361-P)
 - b. Seminar in Language Development (368-P)
 - c. Psychological Foundations of Education (334-P)
 - d. Advanced Seminar [when related to Cognitive Development (368-P)]
3. One course in social development, to be selected from the following:
 - a. Seminar in Social and Personality Development (363-P)
 - b. Seminar in Language Development (368-P)
 - c. Advanced Seminar (when related to Social Development) (368-P)

Note 1: Seminar in Language Development (Psychology 368-P) cannot be used to count dually toward the cognitive development and social development requirements.

Note 2: More topical advanced seminars in language will satisfy either the cognitive development or social development requirement depending on the focus of the seminar.

4. Two advanced developmental seminars

Note: Courses listed in 2 and 3 can be used to satisfy this requirement if they are not used to meet the basic requirements in cognitive and social development

5. Developmental Lunch Bunch. Students may enroll for credit or not, but attendance is required and participation in the form of presentations is expected. Beginning in the second year, students will generally be expected to present their research once a year in Developmental Lunch Bunch.
6. Developmental Research Methods (303-P)
 - a. Attendance and participation in the “home” (usually the major professor’s) research group
 - b. At least two semesters of participation in a different research group or groups

Note: Students may fulfill part of this requirement by attending research laboratory meetings but not receiving formal course credit if they have already met their maximum allowable hours for a given semester with other courses.

Substitutions or exceptions may be allowed with the written approval of the Director of Developmental Training.

C.2. Research Requirements

It is expected that: (1) students will conduct at least one empirical research project, usually a Master’s project, prior to reaching Ph.D. candidacy; (2) this project will culminate in a manuscript that can be submitted for publication; and, (3) this project will preferably be completed no later than the beginning of the third year. The student’s primary advisor will be the principal supervisor of the project. The Advisory Committee (see below) will review the empirical project. Students will submit their final manuscript to their committee for review. The primary advisor will provide feedback to the student concerning the evaluations made by committee members. Students are encouraged to discuss their manuscript and the evaluations with the other member(s) of their committee.

Students also will have the opportunity to present their work during Developmental Lunch Bunch. In addition, students are strongly encouraged to present their work at professional conferences.

C.3. Advisory Committee

The Advisory Committee, whose job it is to oversee student progress, will be selected in the fall semester of the first year in collaboration with the major advisor. The Advisory Committee consists of two or three faculty members (including the student’s advisor) chosen in the first year. When other committees are formed in subsequent years (e.g., the Master’s Committee, the Continuing Committee evaluating the Qualifying Exam), that committee becomes the student’s Advisory Committee. Membership on the Advisory Committee requires approval of the Director of Developmental Training.

C.4. Master’s Committee

The Advisory Committee may become the Master’s Committee, but the committee may also be reconstituted to reflect the content of the Master’s project. The committee consists of two or three faculty members (including the student’s advisor),

with at least two members being core members of the Developmental faculty. Committees must be approved by the Director of Developmental Training.

C.5. Annual Review

The student will complete a milestone report and current CV to be submitted in the spring of each year. The Advisory Committee will meet with the student to review progress during the previous year. The entire developmental faculty will then meet the final Friday of the spring semester to review the Advisory Committee reports. It is the student's responsibility to prepare the report and convene the advisory committee before the faculty meets. The milestone report will include evidence of student progress in coursework, research, and other training. Evidence of research progress may include submissions to national or regional meetings, papers submitted, proposals written and defended, and data collected. A written report from the Developmental faculty documenting each student's progress is prepared in conjunction with the student and placed on file each spring with the graduate coordinator.

C.6. Qualifying Examination

As described in the Graduate School Bulletin, the purpose of the qualifying (i.e., preliminary) examination is to evaluate the student's knowledge of the field of specialization, to assess familiarity with the published literature, and to determine whether the student possesses the skills necessary to be advanced to doctoral candidacy and to succeed in a scholarly career.

A Qualifying Committee will evaluate the preliminary exam. The Qualifying Committee consists of at least four members of the Graduate Faculty with at least three members within the student's home department (typically P & HD) and at least one faculty member from outside the home department (i.e., either from the other Psychology Department or another Vanderbilt Department such as the Department of Psychiatry at the Vanderbilt Medical School). If the student has a minor concentration, one member of the committee should be from the minor area.

Faculty members from other universities can serve on Qualifying Committees. If they are a fifth committee member, they can simply be added to the committee. But if this person is intended to count as the committee member from outside the home department, then the committee nomination form must be accompanied by the following: (1) A letter from the student's primary advisor that clearly states why this outside committee member has unique expertise that contributes a unique perspective on the student's work, (2) a description of how this outside committee member will contribute to the student's training above and beyond simply calling into the qualifying examination and dissertation meetings, and (3) a curriculum vitae of the outside committee member. It probably goes without saying that the outside committee member must have academic credentials comparable to that of faculty at Vanderbilt. But just as important, there must be mechanisms in place that allow the graduate student to have meaningful interactions with the outside committee member apart from committee meetings – the most obvious mechanism would be an active collaboration, but other mechanisms are possible as well.

In forming a Qualifying Committee, the students should consult with their advisors and the two should mutually decide upon a set of faculty members who would be appropriate for the committee. The student should then submit this set of recommendations to both the Director of Developmental Training and the Director of Graduate Studies of the home department. Following any discussions that may be necessary with the student, the Director of Graduate Studies will make recommendations to the Dean of the Graduate School for the formal appointment of the Qualifying Committee. The Qualifying Committee will also typically serve as the Dissertation Committee, although this is not a formal requirement.

The Qualifying Committee and the student will develop a reading list that is finalized in the spring of the second year. In the spring semester of the third year each student will take a qualifying exam based on the readings, coursework, research experience, and other relevant experiences to date. The qualifying exam covers basic developmental issues and questions, research methods and statistics, and current literature in the field and in the student's specialty area. Special exceptions will be considered for students wishing to write a Major Area Paper instead of taking the exam.

The qualifying exam itself will consist of the written component plus an oral examination that focuses on the written component but encompasses even broader issues of relevance. After reviewing the qualifying examination, the committee will vote on the performance of the candidate. The possible options are: (1) pass, which means that the student advances to doctoral candidacy and is allowed to prepare a dissertation proposal; (2) conditional pass, which means that the student must undertake some specific additional work before a pass can be recommended; and, (3) failure, either with the option of re-examination, or without (in the latter case, the student will be terminated from the program). Failure to pass the qualifying examination after three tries will result in termination from the program.

C.7. Doctoral Dissertation

Developmental students must follow the guidelines for dissertation proposal meetings and final orals outlined in Section IX below.

D. Neuroscience Area

The goal of the Neuroscience Program is to form the next generation of leading neuroscientists. To achieve this goal, our program emphasizes intensive research experience with one or more faculty members from the first year of graduate school. This laboratory experience is complemented in the first two years of graduate school by course work to provide at once a broad and deep conceptual background of the field.

D.1. Course Requirements

In addition to meeting all general course requirements applicable to all graduate students, students in the Neuroscience program must pass (with a grade of B- or greater) the following courses:

1. Systems Neuroscience (Nuro 340)

2. One of the following two courses:
 - a. Cognitive Neuroscience (Nuro 330)
 - b. Cellular and Molecular Neuroscience (Nuro 345)
3. The Neuroscience program requires participation in a weekly seminar (358-A&S) that primarily involves presentations by faculty, students, and guests. Students formally register for this seminar during the second and third years. In the first year, students audit this seminar.

D.2. Research Requirements

Students are expected to complete a research project in each of the first two years. An Advisory Committee, consisting of three faculty members (including the advisor) from Psychological Sciences, will evaluate students' research progress and provide feedback about research. The advisor will serve as chair of the Advisory Committee. Meetings with the Advisory Committee must occur by May 31 of each of the first two years. At least one week before the meeting, students will provide committee members with written evidence of research productivity. Such evidence may consist of papers describing completed research projects (e.g., APA style papers ready for submission to journals) and/or papers submitted to conferences. During the Advisory Committee meeting, students will be expected to give an oral presentation describing the research that they have conducted during the past year. Following this presentation, the Advisory Committee will discuss the presentation and written report with the student. At the end of each meeting, the members of the Advisory Committee will meet without the student present and individually complete Research Evaluation forms. The committee will then discuss their ratings and comments including any discrepancies in their evaluations. Following each meeting, the advisor will provide feedback to the student concerning the committee's evaluations.

At the end of the first year, students are encouraged, and may be required by their advisor, to give a brief public presentation of their research at the annual first-year research presentations scheduled for early May. Second year students are expected to present their research at one of the Thursday Neuroscience seminars (either the fall or spring semester of the second year).

D.3. Qualifying Examination

As described in the Graduate School Bulletin, the purpose of the qualifying examination is to evaluate the student's knowledge of the field of specialization, to assess familiarity with the published literature, and to determine whether the student possesses the skills necessary to be advanced to doctoral candidacy and to succeed in a scholarly career.

A Qualifying Committee will evaluate the qualifying exam. The Qualifying Committee consists of at least four members of the Graduate Faculty with at least three members within the student's home department (A&S Psychology) and at least one faculty member from outside the home department (e.g., either from the other Psychology Department or another Vanderbilt Department such as the Department of Pharmacology at the Vanderbilt Medical School). In forming a Qualifying Committee,

students should consult with their advisors and the two should mutually decide upon a set of faculty members who would be appropriate for the committee. Students should consult with their advisor or the DGS to ensure that an outside committee member from Psychology and Human Development is from a substantively different area of research (e.g., a Neuroscience graduate student doing cognitive neuroscience research should probably not select a Cognition and Cognitive Neuroscience faculty member from Psychology and Human Development as their outside committee member). Students should then submit this set of recommendations to the Director of Graduate Studies of the home department. Following any discussions that may be necessary with the student, the Director of Graduate Studies will make recommendations to the Dean of the Graduate School for the formal appointment of the Qualifying Committee. The Qualifying Committee will also typically serve as the Dissertation Committee, although this is not a formal requirement.

Faculty members from other universities can serve on Qualifying Committees. If they are a fifth committee member, they can simply be added to the committee. But if this person is intended to count as the person from outside the home department, then the committee nomination form must be accompanied by the following: (1) A letter from the student's primary advisor that clearly states why this outside committee member has unique expertise that contributes a unique perspective on the student's work, (2) a description of how this outside committee member will contribute to the student's training above and beyond simply calling into the qualifying examination and dissertation meetings, and (3) a curriculum vitae of the outside committee member. It probably goes without saying that the outside committee member must have academic credentials comparable to that of faculty at Vanderbilt. But just as important, there must be mechanisms in place that allow the graduate student to have meaningful interactions with the outside committee member apart from committee meetings – the most obvious mechanism would be an active collaboration, but other mechanisms are possible as well.

The written component of the qualifying examination will consist of either:

1. A Major Area Paper (MAP) that is an integrative review of an area of study that typically has been the focus of the student's research for the past several years. It should have the scope and length of review articles that appear in the *Annual Review of Neuroscience* or,
2. A proposal for a set of experiments that has the format, structure, and goals of a grant proposal submitted to a funding agency.

The qualifying examination itself will consist of the written component plus an oral examination that focuses on the written component but can encompass even broader issues of relevance. The qualifying examination must be held no later than May 31 of the third year. For that examination, the student will meet with the Qualifying Committee. Students who fail to meet this requirement by the May 31 deadline will be terminated from the program. One focus of the meeting will be the written product with additional foci introduced at the discretion of the committee.

At the end of the meeting, the committee, in executive session, will vote on the performance of the candidate. The possible options are: (1) pass, which means that the student advances to doctoral candidacy and is allowed to prepare a dissertation proposal; (2) conditional pass, which means that the student must undertake some specific additional work before a pass can be recommended; (3) failure, either with the option of reexamination, or without (with the latter option meaning termination from the program). Failure to pass the qualifying examination after three tries will result in termination from the program.

D.4. Dissertation Proposal and Dissertation

Students must follow the guidelines for dissertation proposal meetings and final orals outlined in Section IX below.

As stated in the general guidelines, there is no single model or set of expectations for the final dissertation or the dissertation proposal. The expectations are determined by the advisor and the committee, in consultation with the student. A dissertation may reflect a single substantive research project outlined in the proposal or it may reflect the culmination of a few years of research on single topic.

For the latter case, one model some advisors and committees have recommended for their graduate students is that the final dissertation should include work equivalent to three published papers (of average length as defined by the subarea of research). Under that model, a good rule of thumb is that the dissertation proposal should also reflect proposed research broadly equivalent to one or more of those to-be-published papers. The dissertation proposal should then include as appendices any completed manuscripts and publications that will be part of the final dissertation.

The Neuroscience area group expects a brief presentation of the dissertation before the oral examination in a public format that is open to the broader University community. However, only Committee members will be present during the dissertation defense and during deliberations by the Committee concerning the student's qualifications and performance.

E. Quantitative Methods and Evaluation (QME) Area

The primary aim of the QME program is to offer students and advisors a program of studies that provides a balance between specific course requirements and participation in research, while recognizing the diverse demands presented by the different programs offered within Psychological Sciences. The program emphasizes the development of both quantitative and methodological expertise and strong communication skills.

E.1. Major Advisor and Advisory Committee

A major advisor, who is selected at the time of admission, supervises each student. An Advisory Committee, consisting of the advisor and two additional members of the QME area, is formed during the first year. In cases where the student's research interests require substantive expertise from outside the QME area, a fourth member from outside the QME area may be added.

E.2. Course Requirements

1. The core sequence
 - a. The required first-year graduate statistics sequence as described in Section VI.A.above.
 - b. The following four additional courses:
 1. Psychological Measurement (317-P)
 2. Correlation and Regression (313-P)
 3. Multivariate Analysis (312-P)
 4. One research methods class from the following list:
 - a. Methods of Psychological Research (301-P)
 - b. Field Research Methods (304-P)
 - c. Clinical Research Methods (310-A&S)
2. QME breadth requirements

Four additional courses chosen by the advisor and student from a list of offerings that includes standard courses, topical seminars, and appropriate courses in our own and in other graduate programs. The current list of topics is: Factor Analysis, Individual Differences, Program Evaluation, Analysis of Quasi-Experimental Designs, Survey Research, Philosophical Foundations, Meta-Analysis, Hierarchical Linear Modeling , Structural Equation Modeling, Item Response Theory, Linear and Non-Linear Mixed Models, and other topical Quantitative Seminars.

3. Proficiency in one year of calculus

All students are required to demonstrate proficiency in two semesters of undergraduate-level first-year university calculus taught at the university level. Such proficiency is gained either through having taken the courses prior to entering the QME Program (e.g., during undergraduate training) or by attendance in classes offered at Vanderbilt.

E.3. Annual Review

Each QME student will complete a progress report and current curriculum vita that are submitted to the Advisory Committee in the spring of each year. The progress report includes evidence of progress in coursework, research, and other training. Evidence of research progress may include papers submitted to journals or national or regional meetings, proposals written and defended, and data collected. The student and advisor should schedule an official meeting with the Advisory Committee to discuss the student's progress. Following the meeting, the advisor drafts a letter of progress, constructively evaluating the student's performance. This letter is forwarded to the Advisory Committee for comments/corrections, and then sent to the Director of the QME Area. When such letters have been obtained for all students in the QME Area, an annual Student Progress Evaluation Meeting of all area faculty members is held for open discussion and ratification of the student progress letters. After final ratification by the QME Area, evaluation letters are mailed to the students under the signature of the QME Director. Copies of these letters are placed on file each spring with the Director of Graduate Studies of the home department.

E.4. Annual Research Presentation

Developing oral presentation and teaching skills is a crucial part of the development of the QME student. Each year, the student must make at least one oral presentation. This can be a presentation to a QME brown bag on current research, a tutorial on some interesting area in Quantitative Methods and Evaluation, a proposal for master's thesis research, or a presentation at an academic conference.

E.5. Second-Year Examination

The Advisory Committee and the student will develop a second-year examination reading list, which is finalized in the spring of the second year. By September of the third year the student must take a second-year examination based on the readings, coursework, research experience, and other relevant educational experiences. The second-year examination is based on the quantitative classes that the student has taken up to that point in time, with a particular focus on core classes. Passing the second-year exam is required for remaining in the program. Students failing the first administration of the second-year examination are expected to meet with their major advisors to discuss areas of deficiency, and then will be allowed to retake the exam one time. Failure a second time will result in termination from the program.

E.6. Master's Thesis/Qualifying Examination

After passing the second-year examination, and obtaining approval from the Advisory Committee, the student should commence work on the master's thesis. In addition, the student should form a Qualifying Committee that will evaluate the Master's Thesis. In the QME area, the master's examination serves as the qualifying examination for admission to doctoral candidacy. This examination must be completed no later than the end of the student's third year. As described in the Graduate School Bulletin, the purpose of the qualifying examination is to evaluate the student's knowledge of the field of specialization, to assess familiarity with the published literature, and to determine whether the student possesses the skills necessary to be advanced to doctoral candidacy and to succeed in a scholarly career.

The Qualifying Committee should consist of three faculty members of the QME area (normally the student's Advisory Committee) and one from outside the home department (i.e., either from the other Psychology Department or another Vanderbilt Department such as the Department of Sociology). If the student has a minor concentration, one member of the committee should be from the minor area. In forming a Qualifying Committee, the student should consult with her or his advisor and they should mutually decide upon a set of faculty members who would be appropriate for the committee. The student should then submit this set of recommendations to the Director of Graduate Studies of the home department. Following any discussions that may be necessary with the student, the Director of Graduate Studies will make recommendations to the Dean of the Graduate School for the formal appointment of the Qualifying Committee. The Qualifying Committee will also typically serve as the Dissertation Committee, although this is not a formal requirement.

The student should present a proposal for a master's thesis as soon as possible after passing the second-year exam. Generally, the student will have laid the groundwork for this proposal while studying for the second-year examination. The student may choose to make a formal oral presentation of the master's proposal in satisfaction of the annual research presentation requirement.

After completing the Master's thesis, and obtaining preliminary approval from the major advisor, the student should make copies of the Master's thesis available to all members of the Qualifying Committee, and schedule a meeting of the committee. At this meeting, the student must make an oral presentation (between 20 and 30 minutes in length) of the Master's thesis research. The Master's examination committee evaluates the thesis and the oral presentation.

At the end of the meeting, the committee, in executive session, will vote on the performance of the candidate. The possible options are: (1) pass, which means that the student advances to doctoral candidacy and is allowed to prepare a dissertation proposal; (2) conditional pass, which means that the student must undertake some specific additional work before a pass can be recommended; (3) failure, either with the option of reexamination, or without (with the latter option meaning termination from the program. Failure to pass the qualifying examination after three tries will result in termination from the program.

E.7. Dissertation Proposal and Dissertation

Students must follow the guidelines for dissertation proposal meetings and final orals outlined in Section IX below.

The QME area group expects a brief presentation of the dissertation before the oral examination in a public format that is open to the broader University community. However, only Committee members will be present during the dissertation defense and during deliberations by the Committee concerning the student's qualifications and performance.

E. 8. Standard Timeline for fulfillment of requirements for students in the QME program²

<p>1. Year 1³</p>	<p>a. Semester 1: Select major advisor Select advisory committee Complete Psychology 310P</p> <p>b. Semester 2: Begin preparing an oral presentation. Complete second course in the first year sequence Begin involvement in research with major advisor Make first year oral presentation</p>
<p>2. Year 2²</p>	<p>a. Semester 1: Take 2 courses from the Core Sequence Group</p> <p>b. Semester 2: Begin preparing second-year oral presentation Take 2 courses from the Core Sequence Group Create preliminary exam reading list Make second year oral presentation Pass preliminary exam Begin preparing an master's thesis proposal</p>
<p>3. Year 3</p>	<p>a. Semester 1: Take 2 quantitative breadth requirement courses Obtain approval of the master's thesis proposal Complete master's thesis research</p> <p>b. Semester 2: Take 2 quantitative breadth requirement courses Write master's. thesis Form master's examination committee Present thesis draft to major advisor, obtain approval Send thesis drafts to master's examination committee Schedule master's. examination meeting (thesis defense) Defend master's. thesis</p>
<p>4. Years 4-5</p>	<p>Form doctoral advisory committee Research doctoral dissertation topic Complete any unfulfilled course requirements Present doctoral thesis proposal Perform doctoral dissertation research Write doctoral dissertation Defend doctoral dissertation</p>

² The timeline does not include requirements that are broadly applicable to all graduate students in Psychological Sciences and summarized above in Section VI.A.

³ Calculus requirement should be fulfilled, if necessary, during the summer of the first and second year.

VIII. Master's Degree

Our program is not designed for students with a primary interest in a terminal Master's degree. Students can, however, receive a Master's degree during their tenure at Vanderbilt. Students affiliated with the Department of Psychology can receive a Master's of Arts degree while those affiliated with the Department of Psychology and Human Development can receive a Master's of Science degree. Those who wish to receive a Master's degree must fulfill the requirements as listed in the Graduate School Bulletin. To be eligible to receive a Master's degree, the student must have completed a minimum of 24 hours of formal course work. The student must also complete a master's thesis project. The written thesis must be approved by two faculty members in the program.

IX. Doctoral Dissertation

All our doctoral programs require that a doctoral dissertation proposal should be submitted after the Qualifying Examination has been successfully completed. The student and his or her advisor will determine the composition of the Ph.D. Committee. In most cases, the Qualifying Committee will constitute the Ph.D. Committee. As is the case with the Qualifying Committee, the Ph.D. Committee should consist of at least four members of the Graduate Faculty with at least three members within the student's home department (A & S Psychology or P & HD) and at least one faculty member from outside the home department (i.e., either from the other Psychology Department or another Vanderbilt Department such as the Department of Psychiatry at the Vanderbilt Medical School). In the case of Clinical Science and Cognition and Cognitive Neuroscience students, outside-the-department committee members from the other Psychology Department must also be outside the students' area group (e.g., a Peabody and Human Development Cognition and Cognitive Neuroscience faculty member cannot serve as the outside member for a Cognition and Cognitive Neuroscience student from the Arts and Science Psychology department). Furthermore, to keep within the spirit of this rule, students in other area groups should consult with their advisor or the DGS to ensure that an outside committee member from the other psychology department is from a substantively different area of research (e.g., a Neuroscience graduate student doing cognitive neuroscience research should probably not select a Cognition and Cognitive Neuroscience faculty member from Peabody as their outside committee member). Some area groups permit the outside committee member to be from outside of Vanderbilt; see the area group sections for a discussion of the rules for appointing a committee member from outside of Vanderbilt (under the section for the Qualifying Examination). The advisor will serve as Chair of this committee. The composition of the Ph.D. Committee must be approved by the Director of Graduate Studies of the student's home department and the Graduate School.

Working with the advisor, the student will prepare a dissertation proposal. The format of the dissertation proposal, as well as the format of the final dissertation, can vary quite a bit across area groups. Some may be proposals for a completely new line research, others may be proposals to continue a successful line of research in new directions, and others may include a fair amount of completed research as well as proposals for new

experiments or new analyses. The student will need to work with their advisor and the committee members to determine what constitutes a sufficient proposal for new research for their dissertation. The dissertation committee has wide latitude in determining what is sufficient based on the norms for the area group and the field, and based on the body of independent research completed by the student throughout their graduate career at Vanderbilt.

There are no formal requirements for what should or should not go into the dissertation proposal, but the following guidelines may be useful:

- Proposals should include some general background about the scientific problem. This should not be a complete literature review, as might be done for MAP, nor should the MAP be pasted into the proposal. Instead, there should be a brief yet relatively complete discussion, such as you might see in the introduction to a large empirical or theoretical paper or see in the background section of a grant proposal.
- As appropriate, the proposal should include an integrative discussion of the student's past research on this scientific problem. This may be pilot research on the proposed experiments. It could also be completed manuscripts and publications that the student will include as part of their complete dissertation.
- If the final dissertation will include papers complete before the dissertation proposal meeting, those papers should be included as appendices to the proposal. The proposal itself should include a detailed discussion of those papers wherever appropriate in the text of the proposal. The completed papers themselves should not be simply pasted into the main body of the proposal itself.
- Students should respect the appropriate tense in their writing. Completed research should be written as completed research, not as proposed research. A large project may have data collection that has been completed and analyses that are proposed, and the proposal should be written to reflect that reality.

It is important to emphasize that the composition of the dissertation proposal is quite heterogeneous across area groups, advisors, and research areas. For some, the dissertation may constitute a single substantive research project completed during the dissertation year. For others, the dissertation proposal may reflect one key aspect of a large-scale project the graduate student has been involved in over the span of several years. And for others, the dissertation proposal may include published or submitted papers completed before the proposal as well as a proposal for new research. The required composition of the dissertation proposal is determined by the advisor and committee, in consultation with the student. What another graduate student did or did not do for his or her proposal is not relevant to these discussions.

Another important thing to emphasize is that the proposal must include some new proposed research. The purpose of the proposal meeting is not to rubber stamp completed research. The relative amount of new research in the proposal is determined by the advisor and committee, in consultation with the student.

Further information about particular models for dissertation proposals may also be provided under the descriptions of each area group.

The proposal should be distributed to committee members at least two weeks prior to a meeting of the thesis committee. During the meeting, it is the student's responsibility to demonstrate to the committee that the proposal is scientifically sound, that the proposed research procedures are feasible (such demonstrations frequently involve extensive pilot research and/or completed research in the area), and that the requisite skills and other resources are available to complete the proposed project in a reasonable time period. After the meeting, the committee can make several alternative decisions, ranging from complete acceptance and approval of the proposal to the requirement that the student prepare a completely different project proposal.

After the proposal is approved the student is free to complete the dissertation under the supervision of the advisor. We strongly discourage students from attempting to complete the dissertation in absentia. Students who decide to complete their dissertation in absentia must submit a timeline for completing their dissertation that must be approved by the advisor and the Director of Graduate Studies of the student's home department.

There may be times when significant changes to the proposed research are required after the proposal meeting (e.g., initial studies do not turn out as predicted, clinical populations cannot be recruited, etc.); the student should discuss with their advisor what constitutes "significant change" from the original proposal. If those changes are indeed significant, the student must contact the dissertation committee members to notify them of the need for a change and to invite the committee to have another meeting when necessary.

When the advisor serving as the Ph.D. Committee Chair believes that the candidate has prepared an acceptable draft of the dissertation, the student will schedule the final oral examination. The Director of Graduate Studies of the home department will then notify the Graduate School two weeks prior to the exam. The student will distribute the final draft to the committee members at least two weeks before the scheduled Final Oral Examination.

Both the Neuroscience and QME area groups expect a presentation before the oral examination in a public format that is open to the broader University community. However, only Committee members will be present during the dissertation defense and during deliberations by the Committee concerning the student's qualifications and performance.

Typically, the dissertation defense will begin with a presentation and summary by the student of the conceptual and methodological basis for the study or studies that were conducted and the results and conclusions. After this presentation, committee members will ask questions and stimulate discussion about various issues related to the dissertation project. At the end of the oral examination, the committee, in executive session, will vote on the performance of the candidate. The possible options are: (1) pass; (2) conditional pass, which means that the student must undertake some specific additional work before a pass can be recommended; (3) failure, either with the option of re-examination, or without (in the latter case, the student will be terminated from the program).

The dissertation must be approved by the Ph.D. Committee before it is submitted to the Graduate School. The Graduate School has a set of guidelines available to students regarding the correct format for dissertations submitted to the Graduate School.

According to Vanderbilt University regulations, the Ph.D. dissertation must be completed and the dissertation defense passed within four years after the student has passed the Qualifying Exam and has been admitted to candidacy for the degree. Upon petition to the graduate school by the Director of Graduate Studies of the student's home department, a one-year extension of candidacy may be granted. If the time period allotted has expired without successful completion of the dissertation defense, the student is formally removed from the rolls of the Graduate School and will have to re-apply for admission which is subject to the approval of the program faculty. Students re-admitted in this manner may be required to retake the Qualifying Examination.

X. Minors

No minor concentration is required of students in Psychology and the Neuroscience program requires that its students not seek a minor concentration. Students in other programs may elect to have a minor in an area of Psychology other than their primary area of specialization. Specific area groups determine whether a minor option is offered and the specific requirements for a minor. At the present time, the Cognition and Cognitive Neuroscience, Developmental Science, and Quantitative Methods and Evaluation areas offer minors. The Clinical Science and Neuroscience areas do not offer minors. The specific requirements are as follows:

A. Cognition and Cognitive Neuroscience

Four courses in the Cognition and Cognitive Neuroscience areas (12 credit hours) approved by the head of the Cognition and Cognitive Neuroscience area of the student's home department.

B. Developmental Science

1. Developmental Psychology 360 (can be taken as part of departmental requirements)
2. One course in Cognitive Development, to be selected from the following:
 - a. 361P Seminar in Cognitive Development
 - b. 368P Seminar in Language Development
 - c. 334P Psychological Foundations of Education
3. One course in Social Development, to be selected from the following:
 - a. 363P Seminar in Social and Personality Development
 - b. 368P Seminar in Language Development
4. One advanced Seminar (courses listed in 2 and 3 can be used to satisfy this requirement if not used to meet the basic requirement in cognitive or social development)

C. Quantitative Methods and Evaluation

The quantitative core sequence consisting of:

1. The required first-year graduate statistics sequence

2. The following four additional courses
 - a. Psychological Measurement (317-P)
 - b. Correlation and Regression (319P)
 - c. Multivariate Analysis (312-P)
 - d. One research methods class from the following list:
 1. Methods of Psychological Research (301-P)
 2. Field Research Methods (304-P)
 3. Clinical Research Methods (310-A&S)

XI. Teaching

Since the teaching of psychology is something most, if not all, of our students will do at some point in their careers, it is important that they receive some instruction and experience in teaching. For this reason, all students in the program are encouraged to be a teaching assistant in Psychology for at least two semesters during their residence. In order to maintain good standing in the program, a graduate student funded by a teaching assistantship must show satisfactory performance in their TA duties, as assessed by faculty and student evaluations.

XII. Student Evaluations

The relevant departmental faculty reviews all students in yearly evaluation meetings that occur at the end of each spring semester; in some cases, faculty reviews also occur in the fall semester. The major components of these evaluations are: (1) grades in courses; (2) research performance; (3) performance of other milestones (e.g., written qualifying exams); and, (4) performance as a teaching or research assistant (if relevant). We also carefully consider other factors that have a bearing on scholarly potential and career development.

Grades in courses that are less than a C (C- or below) are considered failing. Grades of B- or below are considered cause for concern. All students must have a minimum grade point average of greater than 3.0 (A = 4, B = 3, C = 2) to remain in good standing. Courses included in the computation of GPA include all core courses and seminars. Courses not included in the computation include program seminar series, research credits, practicum credits, and lab/research meetings. Please note that this grade standard is higher than the minimum standard set by the Graduate School.

A satisfactory evaluation of research progress requires evidence of continual involvement in research-related activities, a level of competence appropriate to the student's experience and area of specialization, and satisfactory completion of research milestones in the required time frame. There should also be evidence for increased research productivity and increased intellectual independence as the graduate student moves through their graduate training.

A satisfactory evaluation of performance as a teaching or research assistant is determined through written evaluation by the faculty supervisor and by student course evaluations (in the case of TA appointments).

The faculty's annual evaluation of a student will result in one of four possible decisions:

(1) Good standing: The student is considered to be in good standing in the Department and is encouraged to continue.

(2) Probation. If placed on probation, a student will be given a limited period of time (usually a semester) within which he or she must demonstrate competence in the areas of substandard performance in order to be permitted to continue in the program. The specific accomplishments required of a student in order to be removed from probation will be stated to the student at the time a probation decision is made. If a student fails to remove him- or herself from probation during the allotted time, he or she may be permitted to take a terminal Master's degree, or may be asked to leave the program immediately, depending upon faculty evaluation of his or her work.

(3) Terminal Master's Degree. If the student has not yet received a M.A. or M.S. in Psychology, the student will be permitted to submit work towards a terminal Master's degree, but will not be allowed to continue to the Ph.D.

(4) Termination from the Program. The student will be dropped from the program immediately. A majority vote of the relevant faculty in the home department is required to terminate a student from the graduate program. This recommendation will be transmitted to the relevant Graduate Dean. This decision may be appealed in writing.

It should be emphasized that almost all of our students remain in good standing throughout their graduate careers.

Within two weeks after the annual progress evaluation meeting, each student will receive a letter from the Director of Graduate Studies summarizing his or her program status. Some areas may require a separate evaluation process for their students that incorporates additional criteria (e.g., performance in practica in the case of clinical students).

XIII. Petitions and Exceptions to Requirements

In general, exceptions to the requirements may be granted upon petition to the relevant Director of Graduate Studies (DGS) and Area Group Director (AGD). The student will be required to write a petition explaining the reasons why an exception should be granted and, when appropriate, outline a proposed future course of action.

It is required that the student ask her/his advisor to submit an opinion about the petition. If the advisor does not submit such a statement, it will be assumed by the DGS and AGD that the advisor does not approve the petition. Students have the right to appeal the decision of the DGS and AGD by submitting a petition to the full voting faculty of the home department for consideration. If desired, any member of the student's current committee (e.g., Advisory Committee, Qualifying Committee), as well as the student, has the opportunity to appear before the faculty.

XIV. Ethics

All faculty and graduate students are expected to adhere to the ethical standards summarized in *Ethical Standards of Psychologists* (American Psychological Association). In addition, students are expected to adhere scrupulously to guidelines for treatment of research participants. These guidelines are detailed in *Ethical Principles in the Conduct of Research with Human Participants* (American Psychological Association). All students whose research involves animals are expected to be familiar with the contents of the *Vanderbilt University Information Manual and Guide for Research Animal Use*, and to comply with the policies, standards, and principles contained therein. Violations of ethical standards constitute potential grounds for dismissal from the program.

We expect that interactions among students, faculty, and staff will be collegial and ethical and will reflect the *APA Ethical Principles of Psychologists and Code of Conduct*. In the context of student-faculty relationships, the following sections of the ethical principles are particularly emphasized:

6.03 (b): When engaged in teaching or training, psychologists recognize the power they hold over students or supervisees and therefore make reasonable efforts to avoid engaging in conduct that is personally demeaning to students or supervisees.

6.05 (a): In academic and supervisory relationships, psychologists establish an appropriate process for providing feedback to students and supervisees.

6.05 (b): Psychologists evaluate students and supervisees on the basis of their actual performance on relevant and established program requirements.

If a student believes that violations of ethical principles have arisen in interactions with faculty, other students, or staff members, several avenues of recourse are available. We recommend that initial discussions be held with one of the following: the Director of Graduate Studies, the relevant Area Group Director, or any other faculty member with whom the student feels comfortable. If issues of sexual harassment or discrimination are raised, the student will be encouraged to speak to a representative from the Opportunity Development Center (ODC), the on-campus facility that offers advice to complainants, investigates sexual harassment and discrimination claims, and can serve to mediate disputes.

XV. Complaints and Grievances

The Department of Psychology (Arts and Science) and the Department of Psychology and Human Development (GPC) adhere to Vanderbilt University policy concerning the filing of complaints and grievances. This policy is described in detail in the *Student Handbook* (Chapter 5: University Policies and Regulations), which can be

accessed on the web at the following URL: http://www.vanderbilt.edu/student_handbook

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Appendix A: List of Courses that Fulfill Departmental Distributional Requirements

This appendix lists the courses within each of the eight areas of study that can be used to fulfill the departmental requirement of satisfactory completion of one course from three areas of specialization (9 credits total). This list pertains specifically to the departmental requirements discussed on page 4 and not requirements that are specific to any one area group (e.g., Clinical Science). For additional details concerning these and other graduate classes, see the current edition of The Bulletin of Vanderbilt University Graduate School

I. Clinical Psychology

A. Psychology (Arts & Science)

310. Research Methods in Clinical Psychology. Major methodological and quantitative issues in clinical psychology, including statistical significance testing and its alternatives; threats to internal and external validity; psychometric theory; quantitative approaches to classification; behavioral, genetic, and psychophysiological methods; animal models; analysis of change, mediation, and moderation.

352. Seminar: Clinical Psychology.

B. Psychology and Human Development (GPC)

305P. Research Methods in Child Clinical Psychology. Research with clinical populations with a particular emphasis on methods applied to the study of children, youth, and families.

336P. Behavioral Pediatrics and Child Health Psychology. Behavioral pediatrics and child health psychology for advanced predoctoral and postdoctoral trainees. Topics include the scope and definition of behavioral pediatrics, measurement of child behavior, children's health beliefs and understanding of illness, theories of psychosomatic illness, immunologic and endocrinologic aspects of stress, compliance, psychological effects of physical illness, families' responses to stress, and psychological intervention strategies.

340P. Psychopathology. The major forms of psychopathology: child, adolescent, and adult. Recent research, classification systems, and developmental variables affecting psychopathology.

349P. Advanced Seminar in Clinical Psychology.

384P. Intervention: Basic Issues. Critical analysis of intervention through examination of the historical, philosophical, political, economic, social, ethical, and value issues that underlie intervention efforts by behavioral and social scientists.

II. Cognition and Cognitive Neuroscience

A. Psychology (Arts & Science)

277. Brain Damage and Cognition. Effects of neurological impairment from stroke, injury, or disease on perception, speech, memory, judgment, and behavior. Relation between brain systems and cognitive systems.

301a. Advanced General Psychology (Cognitive)

301b. Advanced General Psychology (Cognitive)

303. Models of Human Memory. Survey of contemporary models of human memory, especially formal models. Methods of fitting models to data will be discussed. Prerequisite: graduate course on cognition.

336. The Visual System. (Also listed as Cell and Developmental Biology 347, Electrical Engineering 351, Neuroscience 347) An interdisciplinary approach to how humans see and interpret their visual environment. Topics include the structure of the eye and brain (including optics), the physiology of individual cells and groups of cells, machine vision and models of visual function, visual attention, and mechanisms of complex visual perception. Lectures by faculty from Psychology, Engineering, and Cell and Developmental Biology. Graduate students attend one hour discussion section per week, in addition to lecture, and turn in a more extensive paper than undergraduates

344. Neurobiology of Attention.

347. Seminar: Learning.

351. Seminar: Cognitive Psychology.

B. Psychology and Human Development (GPC)

350P. Human Learning. Overview of the major experimental approaches to human learning, with an emphasis on the limitations/contributions of each paradigm.

352P. Human Cognition. Current research and theory in cognitive psychology. Emphasis on memory, perception, and language. Some applications of cognitive theories are explored.

353P. Advanced Seminar: Cognitive Studies. Special topics in cognitive studies.

354P. Language and Text Processing. Fundamental survey course in language, required for students in the cognitive studies Ph.D. program. Focuses on the psychological and linguistic aspects of sentence and discourse processing, with some attention to computer simulations. Class sessions are generally a combination of lecture material and student presentation.

361P. Seminar in Cognitive Development. Major theoretical and conceptual issues in cognitive development. Emphasis in current research topics like memory development, reading, conceptual development, semantic development, problem solving, and reasoning. Recommended background: 352P and/or 360P.

380P. Assessment of Intellectual Functioning. The measurement of intellectual functioning; effective report writing; skills associated with test administration and scoring and the development of intelligence over the life span. Behavioral and vocational correlates of intelligence and

competence. Methods for psychoeducational remediation.

381P. Cognitive Theories of Mathematical Learning. (Also listed as MTED 3810.) Examines the research literature on mathematical learning at the elementary and secondary levels. Considers both the epistemological assumptions and implications of information-processing theories, situated cognition theories, activity theory, and constructivism.

C. Other

Computer Science 340. Computational Cognitive Neuroscience. Design and analysis of computational simulations of human behavior and brain function. Information processing accounts of the neural basis of cognition. General connectionist modeling which address the biophysics of active membranes, computations performed by individual neurons, activation dynamics produced by recurrent connectivity and lateral inhibition, mechanisms driving synaptic plasticity, and computational role of neurotransmitter systems. Neural network models of perception, attention, learning, memory, language, categorization, and cognitive control.

Neuroscience 330. Cognitive Neuroscience. This course provides a broad understanding of the state of our knowledge in cognitive neuroscience. The emphasis is on the findings and concepts in the major branches of cognitive neuroscience, rather than techniques (although these will be discussed). The level of analysis will focus on human and non-human primate systems. Prerequisite: an introductory-level undergraduate course in neuroscience or physiological psychology. Basic knowledge of experimental cognitive psychology is desirable but not necessary.

III. Developmental Psychology

A. Psychology (Arts & Science)

301a. Advanced General Psychology (Developmental)

301b. Advanced General Psychology (Developmental)

B. Psychology and Human Development (GPC)

303P. Research Methods in Developmental Psychology. Major empirical approaches to the study of development. Emphasis on human behavioral development, although elements from comparative psychology and biomedical sciences included. [3] (Not currently offered)

360P. Developmental Psychology. Central issues, theories, and methods.

361P. Seminar in Cognitive Development. Major theoretical and conceptual issues in cognitive development. Emphasis in current research topics like memory development, reading, conceptual development, semantic development, problem solving, and reasoning. Recommended background: 352P and/or 360P.

363P. Seminar in Social and Personality Development. Development of personality and social processes, with emphasis on methods of inquiry. Trait theory, socialization processes, origins of gender differences, cultural differences in childbearing practices, experimental and observational methods in developmental research, and development of motivational systems.

368P. Advanced Seminar in Developmental Psychology. May be repeated with a change of topic.

IV. Neuroscience/Physiological Psychology

A. Psychology (Arts & Science)

301a. Advanced General Psychology (Physiological)

301b. Advanced General Psychology (Physiological)

306. Evolutionary Psychology. Interdisciplinary analysis of the origins of mind, with particular emphasis on the mind/brain as a product of biological evolution.

316. Brain Imaging Methods. Principles and methods used in human neuroimaging, with emphasis on functional magnetic resonance imaging (fMRI).

335. Special Topics in Neuroscience. (Also listed as Cell and Developmental Biology 335 and Neuroscience 335) Basic issues in neuroscience. Possible topics include neural development, neural plasticity, regeneration, organization and function of cortex, sensory systems, motor systems, and research methodology in neuroscience. A new topic is considered each semester (as per Cell and Developmental Biology). Prerequisite: Cell and Developmental Biology 323 or equivalent course.

336. The Visual System. (Also listed as Cell and Developmental Biology 347, Electrical Engineering 351, Neuroscience 347) An interdisciplinary approach to how humans see and interpret their visual environment. Topics include the structure of the eye and brain (including optics), the physiology of individual cells and groups of cells, machine vision and models of visual function, visual attention, and mechanisms of complex visual perception. Lectures by faculty from Psychology, Engineering, and Cell and Developmental Biology. Graduate students attend one hour discussion section per week, in addition to lecture, and turn in a more extensive paper than undergraduates.

344. Seminar: Neuroscience

B. Psychology and Human Development (GPC)

355P. Sociobiology. Evolutionary models of social behavior across a wide range of species. Specific topics include: kin selection and inclusive fitness; space utilization; parent-infant interactions; aggression; kin recognition; mate choice and reproductive strategies and communication

357P. Seminar in Behavioral Biology. Selected topics in behavioral biology—e.g., ethology. Content varies according to student needs and interests. May be repeated. [3]

C. Neuroscience (The Graduate School)

Neuroscience 323. The Nervous System. (Also listed as Cell and Developmental Biology 323) Emphasis on providing second-year medical students and graduate students with a solid understanding of the organization of the human central nervous system, integrating basic information from neuroanatomy, neurophysiology, and neurochemistry. Covers the most up-to-date research conducted in neurobiology, with emphasis on research with potential clinical significance. Clinical material is provided by patient presentations, discussions of the impact of neurological disease on patients and their loved ones, and by an analysis of pathological cases. Four hours lecture and four hours laboratory per week. Microscope rental fee is required

Neuroscience 324. Excitable Membrane Properties in Nerve and Muscle. (Also listed as Pharmacology 323 and Molecular Physiology and Biophysics 323) Recent findings concerning the structure, function, and pharmacology of ion channels. Topics will include the relationship between amino acid sequence, protein subunit structure, and function of both voltage- and ligand-gated channels; the relationship between channel structure and pharmacology; the interaction of drugs with channels and receptor/channel proteins, with special emphasis on the interaction of compounds with different functional channel states; indirect coupling between ion channels and neurotransmitter and hormone receptors. Classes will include both presentations by the instructors and discussion of recent publications by students. Prerequisite: consent of instructor.

Neuroscience 325. Neuroscience Foundations. This two-semester course provides discussions on a broad range of neuroscience topics, ranging from reviews of historical concepts and individuals in neuroscience to science journalism. Other topics include scientific ethics, science policy, good grantsmanship, and communication skills.

Neuroscience 330. Cognitive Neuroscience. This course provides a broad understanding of the state of our knowledge in cognitive neuroscience. The emphasis is on the findings and concepts in the major branches of cognitive neuroscience, rather than techniques (although these will be discussed). The level of analysis will focus on human and non-human primate systems. Prerequisite: an introductory-level undergraduate course in neuroscience or physiological psychology. Basic knowledge of experimental cognitive psychology is desirable but not necessary.

Neuroscience 336. Advanced Neuroanatomy (Also listed as Cell and Developmental Biology 336). Designed for graduate and medical students who want to explore in more detail topics covered in Neuroscience 323. Emphasis on advanced neuroanatomical techniques (electron microscopy, freeze-fracture, fluorescence microscopy), on an understanding of original current research conducted in neuroanatomy, and on clinical correlations. Students may elect to emphasize clinical correlations and do three five-week rotations in various subfields of neurobiology (neuro-oncology, surgery, etc.). Admission by consent of instructor.

Neuroscience 340. Systems Neuroscience. Required for Neuroscience majors in the Integrative/Cognitive track. Allows students to develop a working knowledge of neural networks and brain systems and the techniques used to study these functions. Includes an introductory overview of neuroanatomy, physiology, and behavior, and then moves on to the sensory and motor systems, motivation, and learning and memory.

Neuroscience 345. Fundamental Neuroscience. (Also listed as Cell and Developmental Biology 345, Molecular Physiology and Biophysics 345, Pharmacology 345) Required entry-level course for the Ph.D. in neuroscience and an elective for medical students. Students are exposed to fundamental concepts and techniques in molecular and cellular neuroscience and provided with a theoretical context for experimental analysis of brain function. The course is divided into four modules. Module I: Biophysics and Biochemistry of Synaptic Transmission reviews biophysical and molecular concepts relating to membrane excitability, action potential generation and propagation, and the molecular basis of chemical signaling at synapses. Module II: Synaptic Integration and Plasticity discusses mechanisms and models of synaptic integration and plasticity and concentrates on how molecular changes translate into altered synaptic strength and gene expression programs that underlie short and long-term plasticity. Module III: Neural Development examines historical and current concepts in neural pattern formation, neural migration, axon guidance and synapse formation. Module IV: Neural Diseases and Disease Models focuses on specific brain disorders such as epilepsy, depression, schizophrenia, and Alzheimer's disease and current models used to investigate their origin and/or treatment. This course combines faculty lecture with discussion of original articles, with an emphasis on student participation.

Neuroscience 346. Advanced Molecular Neurobiology. (Also listed as Pharmacology 346) This course examines molecular components and interactions that regulate neuronal

development, signaling, and disease. Topics include development of neuronal identity, axonal transport, growth factors and cell death, axon guidance and synapse formation, electrical and chemical transmission, regulation of neuronal excitability and genetic analysis of signaling and neural disorders. Didactic and literature discussions provide students with a sound foundation for understanding the molecular bases underlying the development and function of the nervous system. Prerequisite: 345, Pharmacology 324–325, or consent of instructor.

Neuroscience 348. Contemporary Issues in Behavioral Neuroscience. (Also listed as Pharmacology 348) This course explores recent findings in neuroethology and behavioral neurobiology through presentation and discussion of current research. Topics may include: animal communication; prey capture and orientation; circadian rhythms, sensory systems; neural control of hunger and thirst; hormones and sexual behavior; emotion, reward, and addiction; synaptic plasticity, learning, and memory; and disorders of the nervous system. Methods used to link brain structure and function will be explored.

Neuroscience 355. Integrative Neuroscience. Structure and function of nervous systems. Emphasis on vertebrate brain and the relationship of anatomy, physiology, and biochemistry to sensory perception, cognition, motor activity, and learning and memory. Prerequisite: 201.

D. Neuroscience (College of Arts and Science)

Neuroscience 269. Developmental Neuroscience. (Formerly Psychology 269) Normal and abnormal brain development. Cell division, migration, and death; synapse formation and plasticity; and clinical syndromes. Prerequisite: 201 or PSY 201.

Neuroscience 272. Structure and Function of the Cerebral Cortex. (Formerly Psychology 272) Classic and current concepts of cerebral function. Species differences, receptive field organization, neurotransmitters, modifications by experience, and behavioral effects. Prerequisite: 201 or PSY 201.

Neuroscience 274. Neuroanatomy. (Formerly Psychology 274) Gross structure, histological architecture, and techniques for creating images of the human brain.

E. Other

EECE 350. Artificial Neural Networks. (Also listed as Biomedical Engineering 350 and Computer Science 350) Theory and practice of parallel distributed processing methods using networks of neuron-like computational devices. Neurobiological inspirations, attractor networks, correlational and error-correction learning, regularization, unsupervised learning, reinforcement learning, Bayesian and information theoretic approaches, hardware support, and engineering applications

Hearing and Speech Sciences 300. Neurology of Speech and Language. The structure and function of the nervous system, with emphasis on the neural mechanisms of speech and language. Neurologic conditions producing speech and language disorders are surveyed.

V. Perception

A. Psychology (Arts & Science)

301a. Advanced General Psychology (Perception)

301b. Advanced General Psychology (Perception)

336. The Visual System. (Also listed as Cell and Developmental Biology 347, Electrical Engineering 351, Neuroscience 347) An interdisciplinary approach to how humans see and interpret their visual environment. Topics include the structure of the eye and brain (including optics), the physiology of individual cells and groups of cells, machine vision and models of visual function, visual attention, and mechanisms of complex visual perception. Lectures by faculty from Psychology, Engineering, and Cell and Developmental Biology. Graduate students attend one hour discussion section per week, in addition to lecture, and turn in a more extensive paper than undergraduates.

343. Seminar: Perception

VI. Personality and Individual Differences

A. Psychology and Human Development (GPC)

318P. Individual Differences. Focuses on traditional concepts and findings in the area of individual differences broadly defined. The psychological content will primarily involve abilities, interests, and personality; methodological issues encountered in assessing these attributes will be stressed throughout; and particular attention will be devoted to how these concepts can enhance research programs in both applied and theoretical areas. The specific variables discussed within each domain will be restricted to those that have empirically “panned out” (viz., variables that are reliable and related to meaningful behaviors and outcomes that psychologists are interested in predicting and better understanding), rather than theoretical constructs and measures whose external validity is unknown.

370P. Theories of Personality. Psychoanalytic theories, phenomenological theories, and behavioral theories. The process of theory development and the interaction of theory and empirical confirmation

VII. Quantitative Methods and Evaluation

A. Psychology (Arts & Science)

305. Linear and Nonlinear Mixed Effects Models. The analysis of data from hierarchical and multilevel designs. Theory and computational methods, specification and testing of fixed effects, random effects and residuals, assessment of fit, graphical examination, applications to repeated measures data, and missing data models. Prerequisite: Psychology 310-P, Psychology 304B (A&S), Psychology 313-P, or equivalent preparation. Recommended: Psychology 312-P or equivalent preparation.

309. Structural Equation Modeling. Applications of structural equation modeling. Confirmatory factor analysis, path analysis, causal modeling with latent variables, latent growth curve and panel models, multiple-group and multiple-level models, and the treatment of missing data. Principles of identification, estimation, and fit. Prerequisite: Psychology 310-P, Psychology 304B (A&S), Psychology 313-P, or equivalent preparation. Recommended: Psychology 312-P or equivalent preparation. Exploratory Factor analysis

310. Research Methods in Clinical Psychology. Major methodological and quantitative issues in clinical psychology, including statistical significance testing and its alternatives; threats to internal and external validity; psychometric theory; quantitative approaches to classification; behavioral, genetic, and psychophysiological methods; animal models; analysis of change, mediation, and moderation.

311. Measurement Theory in Psychology. Methodological and mathematical issues in the measurement of psychological attributes: scaling models, psychophysical methods, reliability and validity of measurements, multivariate analysis, and special problems of measurement in research. Prerequisite: Psychology 304b (A&S) or Psychology 311P (GPC) or instructor's permission

B. Psychology and Human Development (GPC)

304P. Field Research Methods. The purpose of this course is to provide the student with an introduction to applied social research in field settings. The course will provide the student with an understanding of basic issues in measurement and design as well as practical skills needed to conduct research in real world settings. Basic knowledge of statistics suggested.

312P. Multivariate Statistics. Psychological measurement theory, along with correlational and regression analysis techniques essential to the development of that theory. Prerequisite: Psychology 310-P, Psychology 304B (A&S), or equivalent preparation.

313P. Correlation and Regression Theory and practices underlying bivariate and multi-regression/correlation methods. Includes: the full range of correlation and covariance indices; an array of common regression analysis strategies (e.g., reduced-form regression, path analysis, ordered and unordered step-wise inclusion, mediator and moderator models); tests of assumptions and regression diagnostics; nonlinear regression and linearizing transformations; statistical power; and causal analysis with manifest variables. Prerequisite: At least 1 graduate-level statistics course.

314P. Structural Equation Modeling This course introduces the basic principles of path analysis, confirmatory factor analysis, and latent variable structural modeling, which constitute a powerful set of statistical tools for examining correlational, observational, and even experimental data in the social sciences. Computer techniques for conducting these analyses will also be taught: the LISREL program in particular, but AMOS will also be introduced. Prerequisite: Psychology 310-P, Psychology 304B (A&S), Psychology 313-P, or equivalent preparation.

Recommended: Psychology 312-P or equivalent preparation. Exploratory Factor analysis.

315P. Program Evaluation. The evaluation of social programs. The design of evaluations to produce both theoretically meaningful and practical information about the program and its effectiveness. Such topics as needs assessment, monitoring, impact assessment, and cost/effectiveness evaluations. Covers programs in education, health, and human services

317P. Psychological Measurement. Fundamental concepts, methods, and principles of psychological measurement. Particular attention will be devoted to reliability and validity issues underlying psychometric theory, and how psychometric theory relates to the assessment of individual differences or human variation more generally. Topics will include multiple regression, factor analysis, and item response theory.

319P. Advanced Seminar in Measurement, Statistics, and Evaluation. Special topics in measurement, statistics, and program evaluation. May be repeated with change of topic. Prerequisite: consent of instructor.

VIII. Social Psychology

A. Psychology (Arts & Science)

238. Social Neuroscience

301a. Advanced General Psychology (Social Psychology)

301b. Advanced General Psychology (Social Psychology)

307. Group Process and Structure. Social psychological theory relating to phenomena of social interaction; methodological and substantive problems in selected areas of research, such as group problem-solving, and interpersonal bargaining.

342. Seminar: Social

B. Psychology and Human Development (GPC)

353P. Advanced Seminar: Cognitive Studies. Special topics in cognitive studies, if topic is relevant to social psychology. Permission of W. Smith or C. Smith is required in order for this course to count toward the Social Psychology area requirement

363P. Seminar in Social and Personality Development. Development of personality and social processes, with emphasis on methods of inquiry. Trait theory, socialization processes, origins of gender differences, cultural differences in childbearing practices, experimental and observational methods in developmental research, and development of motivational systems

375P. Social Psychology. Emphasis on current theory and research.

378P. Current Research in Social Psychology. A seminar on the current state of the field of social psychology as explored through critical analysis of recent journal articles.

379P. Advanced Seminar in Personality and Social Psychology.

Appendix B: List of Courses that Fulfill American Psychological Association (APA) Distributional Requirements

Note: These requirements only apply to Clinical Science students and are discussed on page 6.

I. Biological Aspects of Behavior

A. Psychology (Arts & Science)

301a. Advanced General Psychology (Physiological)

301b. Advanced General Psychology (Physiological)

335. Special Topics in Neuroscience. (Also listed as Cell and Developmental Biology 335 and Neuroscience 335) Basic issues in neuroscience. Possible topics include neural development, neural plasticity, regeneration, organization and function of cortex, sensory systems, motor systems, and research methodology in neuroscience. A new topic is considered each semester (as per Cell and Developmental Biology). Prerequisite: Cell and Developmental Biology 323 or equivalent course.

344. Seminar: Neuroscience

354. Clinical Neuropsychology. Cognitive and behavioral disorders associated with brain injury and disease. Methods of neuropsychological assessment. Prerequisite: 343P or permission of instructor.

358. Seminar in Neuroscience. Integration of the subareas of neuroscience. (enrollment for two semesters is required).

B. Psychology and Human Development (GPC)

357P. Seminar in Behavioral Biology. Selected topics in behavioral biology—e.g., ethology. Content varies according to student needs and interests.

II. Cognitive and Affective Aspects of Behavior

A. Psychology (Arts & Science)

301a. Advanced General Psychology (Cognitive)

301b. Advanced General Psychology (Cognitive)

303. Models of Human Memory. Survey of contemporary models of human memory, especially formal models. Methods of fitting models to data will be discussed. Prerequisite: graduate course on cognition.

351. Seminar: Cognitive Psychology.

352. Seminar: Clinical Psychology: Emotion

357. Seminar in Cognitive Science. Integration of the subareas of cognitive science (enrollment for two semesters is required).

B. Psychology and Human Development (GPC)

352P. Human Cognition. Current research and theory in cognitive psychology. Emphasis on memory, perception, and language. Some applications of cognitive theories are explored. [3]

353P. Advanced Seminar: Cognitive Studies. Special topics in cognitive studies.

361P. Seminar in Cognitive Development. Major theoretical and conceptual issues in cognitive development. Emphasis in current research topics like memory development, reading, conceptual development, semantic development, problem solving, and reasoning. Recommended background: 352P and/or 360P.

380P. Assessment of Intellectual Functioning. The measurement of intellectual functioning; effective report writing; skills associated with test administration and scoring and the development of intelligence over the life span. Behavioral and vocational correlates of intelligence and competence. Methods for psychoeducational remediation.

III. Social Aspects of Behavior

A. Psychology (Arts & Science)

301a. Advanced General Psychology (Social Psychology)

301b. Advanced General Psychology (Social Psychology)

307. Group Process and Structure. Social psychological theory relating to phenomena of social interaction; methodological and substantive problems in selected areas of research, such as group problem-solving, and interpersonal bargaining.

342. Seminar: Social

361. Interdisciplinary Seminar in Social Psychology. Integration of the disciplinary subareas of social psychology (enrollment for two semesters is required).

B. Psychology and Human Development (GPC)

355P. Sociobiology. Evolutionary models of social behavior across a wide range of species. Specific topics include: kin selection and inclusive fitness; space utilization; parent-infant interactions; aggression; kin recognition; mate choice and reproductive strategies and communication

363P. Seminar in Social and Personality Development. Development of personality and social processes, with emphasis on methods of inquiry. Trait theory, socialization processes, origins of gender differences, cultural differences in childbearing practices, experimental and observational methods in developmental research, and development of motivational systems

378P. Current Research in Social Psychology. A seminar on the current state of the field of social psychology as explored through critical analysis of recent journal articles.

379P. Advanced Seminar in Personality and Social Psychology.

IV. Individual Differences in Behavior

A. Psychology (Arts & Science)

312. Psychological Assessment. Major techniques of psychological assessment, with an emphasis on the rationale, administration, and interpretation of measures assessing personality and psychopathology

B. Psychology and Human Development (GPC)

318P. Individual Differences. Focuses on traditional concepts and findings in the area of individual differences broadly defined. The psychological content will primarily involve abilities, interests, and personality; methodological issues encountered in assessing these attributes will be stressed throughout; and particular attention will be devoted to how these concepts can enhance research programs in both applied and theoretical areas. The specific variables discussed within each domain will be restricted to those that have empirically “panned out” (viz., variables that are reliable and related to meaningful behaviors and outcomes that psychologists are interested in predicting and better understanding), rather than theoretical constructs and measures whose external validity is unknown.

370P. Theories of Personality. Psychoanalytic theories, phenomenological theories, and behavioral theories. The process of theory development and the interaction of theory and empirical confirmation

V. History and Systems of Psychology

History and systems of psychology is covered via an infusion approach such that relevant material is covered in a dedicated and integrated manner with the course content of a number of core courses (310-A&S, 317-P, 343-P, 354-A&S), research seminars (349-P, 360-A&S), and electives (e.g., 338-P, 396-P).

VI. Psychological Measurement

Psychological measurement is covered by the required course in psychological measurement (317-P):

317P. Psychological Measurement. Fundamental concepts, methods, and principles of psychological measurement. Particular attention will be devoted to reliability and validity issues underlying psychometric theory, and how psychometric theory relates to the assessment of individual differences or human variation more generally. Topics will include multiple regression, factor analysis, and item response theory.

In addition, psychological measurement is covered by the required classes in assessment (312-A&S, 343-P, and/or 354- A&S).

VII. Research Methodology

This requirement is fulfilled by the required course on research methods in clinical psychology (310-A&S):

310. Research Methods in Clinical Psychology. Major methodological and quantitative issues in clinical psychology, including statistical significance testing and its alternatives; threats to internal and external validity; psychometric theory; quantitative approaches to classification;

behavioral, genetic, and psychophysiological methods; animal models; analysis of change, mediation, and moderation.

For additional training, students can enroll in several other research methods classes offered by Psychological Sciences faculty (Research Methods in Developmental Psychology (303-P), Field Research Methods (304-P), and Research Methods in Child Clinical Psychology (305-P).

VIII. Techniques of Data Analysis

This requirements is fulfilled by the required first-year statistics sequence (Psychology 310-P and Psychology 304-B):

310P. Statistical Inference. Introductory course designed to familiarize doctoral students with the principles and procedures of statistical inference and to prepare them for more advanced work in research design and analysis

304b. Quantitative Methods and Experimental Design. Principles of experimental design and descriptive and inferential statistics.

For additional training, students can enroll in courses offered by the Quantitative Methods and Evaluation (QME) area group. See the listing of QME classes on pp.40-41.