

Neuroscience Graduate Handbook

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Updated 1/20/2021

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Neuroscience Handbook

I. Introduction

Neuroscience research at West Virginia University takes place in over 50 laboratories across campus, utilizing animal, human, and computer model systems. Research topics encompass embryonic and postnatal development, neurodevelopment, sensory, motor and cognitive function, nervous system diseases and disorders, injury and stroke, normal aging, and neurodegeneration. Neuroscience investigators at West Virginia University strive to expand knowledge of brain function and improve the lives and health of citizens of the state, the country, and the world. We welcome students to the Neuroscience Graduate Program as they join us in this endeavor and train to become the next generation of Neuroscience researchers.

II. Neuroscience Student Training Goals:

- Develop skills in critical thinking and problem solving;
- Read and critically interpret current scientific literature, both generally and specifically in Neuroscience;
- Gain an understanding of the functional complexities of systems neurobiology, including motor and somatosensory systems, behavior, cognitive function, developmental biology, and diseases of the nervous system;
- Develop skills to acquire and integrate knowledge in molecular and cellular structure and function of the nervous system;
- Gain experience in conducting experimental protocols, collecting scientific data, making accurate interpretations based on the evidence, and drawing appropriate scientific conclusions;
- Become proficient in formulating scientific hypotheses and designing experiments to test them;
- Learn the techniques of formal scientific writing and practice these skills when preparing research proposals, dissertations, and scientific publications;
- Develop awareness of the ethical issues related to animal and human experimentation and the relevant laws and regulations
- Practice responsible and ethical research;
- Learn to identify what qualifies as scientific misconduct and how to avoid it and gain an appreciation for the critical need for intellectual honesty and scientific integrity in research;
- Learn to ascertain that studies are scientifically rigorous, and results are robust and unbiased;
- Engage in beneficial collaborations with peers and colleagues; and
- Develop skills in oral, written, and visual communication to facilitate the transfer of information and knowledge to the scientific community and the public.

III. Selection of Dissertation Advisor:

Students typically enter the Neuroscience Graduate Program after successful completion of the core curriculum in the first semester followed by the selection of a dissertation advisor as described in the First Year Handbook (<http://www.hsc.wvu.edu/resoff/graduate-education/phd-programs/biomedical-sciences/1st-year-handbook/>). During the first semester, students will have the opportunity for three research rotations in the laboratories of potential mentors. Selection of rotation advisors is at the discretion of the students; they may choose from the list of available mentors provided each year by the HSC Office of Research and Graduate Education (see [First Year Handbook](#)), but discussions with their temporary advisor, graduate program directors, or the Assistant Vice President for Graduate Education is strongly encouraged. Approval of each rotation advisor is required from the Office of Research and Graduate Education. After completing the rotations, students may request to join the laboratory that best fits their career and scientific plans. This process is coordinated by the Assistant Vice President for Graduate Education and the selection must be agreed upon by the advisor and approved by the Office of Research and Graduate Education (see Handbook for First Year Students). For students interested in joining the Neuroscience Program, the advisor selected should typically be a member of the program, but not the chair of the dissertation committee. In some circumstances, a student may choose to receive their academic training and PhD degree in Neuroscience, but select a dissertation advisor who is not a member of the Neuroscience Graduate Program. In these cases, a separate dissertation committee chair is appointed who is a member of the program and familiar with the requirements of the Neuroscience Program.

A. Expectations of Faculty Mentors

Generally, good mentoring in all its forms involves treating students respectfully and fairly, providing reliable guidance, and serving as a role model for upholding the highest ethical standards. In addition, it is important for mentors to demonstrate willingness to communicate with and to understand each student as a unique individual. Specifically, mentors should recognize and seek to understand the various cultures and circumstances of their students, and build trust and strive to create a comfortable, collegial, and respectful working environment.

Faculty mentoring of graduate students should be provided in three broad areas:

Guiding students through degree requirements.

- Willingness to discuss graduate program requirements and policies that are available online.
- Advising graduate students on developing a dissertation plan, including appropriate course work, research activities, and defining timelines for the completion of each step.
- Providing regular and timely feedback on the progress of graduate students toward degree requirements. This should include advising them on their preparedness to complete the written rigor of prior research, F31+Document and Oral Defense, and dissertation defense.

- Providing feedback and advice about the student's performance in coursework, where appropriate.
- Providing supervision and advising of graduate students when the faculty advisor is on leave or extended absence.

Guiding students through dissertation research.

- Advising graduate students on the selection of a dissertation topic that offers realistic prospects for successful completion within an appropriate time frame, and on the formation of the dissertation committee. An appropriate time frame is no more than 6 total years for completion of a PhD dissertation.
- Providing training and oversight in the design of research projects, in rigorous research methodologies, in theoretical and technical aspects of the dissertation research, in statistical analysis and data interpretation, and in professional integrity.
- Encouraging graduate students to stay abreast of the scholarly literature and of cutting-edge ideas in the field.
- Providing regular feedback on the progress of graduate students toward degree completion, including timely feedback on research, teaching, and other professional activities, and constructive criticism if the student's progress does not meet expectations.
- Evaluating clearly and explicitly the strengths and weaknesses of the student's research.
- Encouraging an open exchange of ideas, including pursuit of the student's ideas.
- Providing and discussing clear criteria for authorship of collaborative research.
- Assisting in finding sources to support dissertation research, such as internal and external fellowships, etc.
- Being aware of the student's research needs and providing assistance in obtaining required resources.
- Encouraging and constructively criticizing oral and written communication.
- Providing timely and thoughtful feedback on manuscripts and other documents as requested.
- Facilitating the preparation of a first-author manuscript, as well as a second manuscript (authorship not specified) to be submitted by the end of year 4.

Guiding students through professional development.

- Encouraging participation in professional meetings of regional and national groups, as well as of learned societies and directly addressing how to network effectively at these events.
- Facilitating interactions with other scientists, on campus and in the wider professional community.
- Helping graduate students develop into successful professionals and colleagues, including encouraging students to participate and disseminate results of research activities in the appropriate scholarly or public forums.

- Facilitating career development, including advising graduate students on appropriate job and career options, as well as on the preparation of application materials for appropriate fellowships, scholarships, and other relevant opportunities.
- Assisting with applications for research funding, fellowship applications, and other applications as appropriate.
- Being the student's advocate in academic and professional communities as appropriate in the professional judgment of the mentor.
- Providing career guidance and support, including assistance in preparation of a CV and postdoctoral applications, writing letters of recommendation in a timely manner, and helping the student prepare for interviews and other recruitment procedures.
- Providing guidance, if asked, about the intersection of concerns around physical and mental health, dealing with stress, or general well-being of the student. This requires being cognizant of campus resources that address these issues.
- Helping graduate students to develop professional skills in writing reports, papers, and grant proposals, making professional presentations, establishing professional networks, interviewing, and evaluating manuscripts and papers.

B. Changing Your Dissertation Advisor

Students may need to change mentors while completing their dissertation research. The protocol for changing mentors depends on the reason for the change:

1. *The mentor has left WVU, and the student is remaining at WVU.* In advance of the initial mentor leaving the University, the student should meet with the Neuroscience Graduate Program Director to set up a plan to select a new advisor. The new advisor must fulfill the requirements described in the section titled *Selection of Dissertation Committee* and research advisor. A wide range of options is available when choosing a new advisor, ranging from continuing the student's current dissertation research to completely redesigning a research plan with a new dissertation committee. Decisions will be made on a case-by-case basis with the student's best interest being the primary goal.
2. *The student and mentor have irreconcilable differences.* Student displeasure with their laboratory and/or mentor does not necessarily mean that the student will need to leave the laboratory. The key to handling this situation effectively is for the student to act quickly after sensing a problem. First, the student must discuss with the mentor what is troubling them. The mentor may not be aware of the issue and alternative arrangements could be designed – adding additional mentors may be helpful. Second, if talking with the mentor or spreading mentoring roles to other individuals does not solve the problem, then the student should discuss the issue with the Neuroscience Graduate Program Director. Third, if continuing in the mentor's laboratory is not an option, then the student will need to consult with the Neuroscience Graduate Program Director and the Assistant Vice President for Graduate Education to identify a new mentor. A new Dissertation Committee Form (see appendix) must be completed identifying the new research advisor and any

changes in the composition of the dissertation advisory committee. Any additional issues should be resolved in consultation with the Neuroscience Program Director and the Assistant Vice President for Graduate Education such as obtaining an extension on the deadline to pass the candidacy exam.

IV. Selection of Dissertation Committee

Each student must assemble a dissertation committee, and have it approved by the end of the spring semester of year 2. Dissertation committees must follow the University and HSC requirements in the WVU Graduate Handbook. Additional Neuroscience program requirements are as follows:

- A dissertation committee must have a minimum of 5 members;
- A dissertation committee must include a minimum of 3 Neuroscience Graduate Program faculty members;
- A majority of the members must be regular members of the Neuroscience Graduate Faculty Program, including the chair or one of the co-chairs*;
- No more than one member may be a nonmember of the WVU graduate faculty* (e.g. from another institution);
- The responsibility of the chair is to ensure that program guidelines are followed;
 - The advisor may not serve as the chair of the committee;
 - The committee chair will be selected by the advisor from one of the program members on the committee;
- At least one member of the committee must be from a program other than the one in which the student is seeking a degree;
- It is “recommended that clinical scientists should be considered for committee membership when appropriate. (NOTE: It is possible that an appropriate clinical scientist may not have graduate faculty status, or associate graduate status. This would be acceptable under the rule stating that one member can be without graduate faculty membership. However, even a non-member is subject to program review and approval and should demonstrate qualifications equivalent to the qualifications for associate or full graduate membership); and
- The chair and members of the dissertation committee must be approved by the Neuroscience Program Director and the Assistant Vice President for Graduate Education.
- The list of Neuroscience faculty is on this page: <https://medicine.hsc.wvu.edu/neuroscience/faculty-staff>.

* WVU Requirement

Each student must meet with their committee at least once per year and complete a formal meeting document (not unlike an NIH noncompeting renewal Progress Report) <https://medicine.hsc.wvu.edu/media/366253/dissertation-committee-meeting-student-progress-report.pdf>. It will be a multipage template to be completed by the student at least two weeks before the scheduled meeting that includes current aims, experiments conducted, progress since

the last meeting, and any changes that have been made since that meeting. This document will be distributed to the Dissertation Committee two weeks before the meeting and, following the meeting, committee recommendations will be recorded as part of the document by the Chair of the dissertation committee who will then file the document after it is approved by all parties. This document will also serve as official notification to the Graduate Student Office that the meeting has been completed. Failure to file the meeting document will result in a research grade of Incomplete that, if not remediated within a semester reverts to a grade of “F”. In Year 5 and later years, meeting frequency will increase to twice a year, and the Program Director will attend these meetings.

Committee Meeting Format:

The committee meeting should begin with the student’s presentation of research and data to the committee. After answering any questions or requests for more information, the student will step out of the room to allow the advisor to discuss the student’s progress with the committee. Then, the advisor will step out of the room to give the student an opportunity to discuss their progress with the committee members.

V. The Neuroscience Program Curriculum

A. Curriculum: The following are required:

- Four total courses:
 - Two specific courses in Neuroscience:
 - Fundamentals of Neuroscience (NSCI 770);
 - Functional Neuroanatomy (NSCI SPTP 793A);
 - And a minimum of 2 electives (at least one should be a proseminar in Neuroscience e.g., Proseminar in Behavioral Neuroscience, Proseminar in Stroke, or Proseminar in Neural Circuits).
 - Electives should be identified and approved in consultation with the advisor and dissertation committee;
- Enrollment in Neuroscience Journal Club (NSCI 761) during the first three years;
 - Beginning year 4 through completion of degree, student should enroll in/attend a journal club selected by the student and advisor;
- Enrollment each year in Neuroscience FORUM (NSCI 760), this includes one presentation of a research seminar to the program faculty and fellow students each year;
 - The first presentation will be in the second semester of year 2;
- Attendance at all Neuroscience-sponsored seminars (Students are not required to enroll in Seminar, but are expected to attend);
- A scientific writing course (e.g., BMS 720);
- Dissertation research:
 - Students must register for research credits each semester as NSCI 797. Performance is graded satisfactory, unsatisfactory or incomplete by their dissertation advisor. The expected learning outcomes, mechanism of evaluation and criteria for grading for this course is described in the NSCI 797 syllabus. Students are expected to make progress on their research while engaging in course work, journal club, teaching, and seminar attendance;

B. Program Milestones

- A written '[Rigor of Prior Research](#)' document successfully completed by the end of the Fall semester of the second year. This document will be written to NIH standards and must be approved by the dissertation committee.
- An F31+Document and Oral Defense presented to the dissertation committee and successfully completed prior to beginning of the 3rd year. An F31+Document is an NIH F31 fellowship application with an expanded Rigor of Prior Research/Literature Review section (page length suggested by the respective dissertation committee);
- Successfully conduct an original research project resulting in one first-author peer-reviewed publication and another publication (authorship not specified); the first-authored paper must be based on their Ph.D. dissertation research, in a nationally or internationally recognized scientific peer-reviewed journal;
 - Notification of publication acceptance is required prior to the dissertation defense;
- A written PhD dissertation that is successfully defended in an open forum leading to the approval of both the oral defense and the written dissertation by the dissertation committee and subsequently submitted to the WVU Theses and Dissertations (ETD) office;
- Teaching: participation in teaching is not a requirement of the program. However, students are encouraged to gain experience in teaching. One possible teaching opportunity available for neuroscience students is to participate as a graduate assistant in Fundamentals of Neuroscience (NSCI 770);
- Individual Development Plan (IDP) (see below for more information); and
 - Beginning in year 2, there must be at least one dissertation committee meeting per year and a Graduate Dissertation Committee Meeting: Annual Review Report and a Dissertation Committee Meeting Evaluation Form submitted to the Program. Beginning in year 5, there must be at least two dissertation committee meetings per year with the Neuroscience Graduate Program Director in attendance and a Graduate Dissertation Committee Meeting: Annual Review Report, and a Dissertation Committee Meeting Evaluation Form submitted to the Program.
- 2 Experiential Learning credits.

C. Individual Development Plan (IDP)

The IDP provides resources to help students evaluate skills and interests in:

- Scientific Knowledge
- Research Skills
- Communication (writing and speaking)
- Professionalism
- Management and Leadership
- Responsible Conduct of Research
- Career advancement

- Networking with professional in the student's field of study.

This information will help the student build the necessary skill set to achieve career success and to make decisions regarding future career options. The role of the dissertation mentor is to help the student to achieve these skills. Students need to review their IDP annually with their advisor.

All Biomedical Sciences Graduate programs will use the IDP template found at (<https://sole.hsc.wvu.edu/>): Health Sciences Center Graduate Programs SOLE site...Content...FORMS-HSC Graduate Students. All incoming Biomedical students will complete this IDP and discuss it with a faculty advisor during Boot Camp, the week before fall semester begins. Once the student joins a laboratory, he/she is to review the IDP with the dissertation mentor. The IDP needs to be reviewed annually and reported using the IDP Annual Review form (available under Forms). Once the form has been submitted, it will be filed in the student's file in the Office of Research and Graduate Education.

C. Neuroscience MD-PhD Students

The Neuroscience Graduate Program welcomes students in the MD-PhD program. MD-PhD students typically join the Neuroscience Program after successful completion of the USMLE Step 1 National Exam at the end of the second year of the medical school curriculum.

- Successful completion of the two-year medical school curriculum at WVU will satisfy the Common Core Curriculum and Neuroscience course requirements (NSCI 770, 772). MD-PhD students are required to take two additional electives recommended by the dissertation committee.
- Laboratory rotations, leading to the selection of the dissertation advisor, are chosen through the MD-PhD program and are completed prior to the entry of the student into the PhD portion of the curriculum. Selection of the dissertation advisor should be completed prior to entering the Neuroscience Graduate Program.
- Dissertation committee must be selected during the first year of the PhD phase.
- A F31+Document and oral defense is required and will follow the format listed for regular graduate students. It is recommended that this be completed during the first year after entering the PhD phase of the program, but it must be completed by the end of the fall semester of the second year in the PhD phase. An F31+Document is an NIH F31 traineeship application with an expanded Rigor of Prior Research/Literature Review section (page length unspecified). Failure to complete the F31+Document and Oral Defense by this deadline will result in dismissal from the doctoral graduate program unless prior approval is provided by the Graduate Studies Committee.
- MD-PhD students will register for the Neuroscience Journal Club and Neuroscience Forum during the PhD phase. An alternative Journal Club may be selected after two years of the Neuroscience Journal Club.
- Students will take the course in scientific ethics taught by the Office of Research and Graduate Studies.

- MD-PhD students are required to attend all Neuroscience-sponsored seminars.
- Requirements for the F31+Document and oral defense, candidacy, dissertation research, dissertation defense, and graduation requirements are identical to those described for regular Neuroscience PhD candidates.

A timeline of the Neuroscience Curriculum requirements is provided on the next page:

Neuroscience Graduate Program Curriculum & Benchmarks

	Year 1			Year 2					
	Fall	Spring	Summer	Fall	Spring	Summer			
Curriculum	Foundations	Neuroanatomy	Experimental Design & Analysis	Fundamentals of Neuroscience	Proseminars/Electives	Scientific Writing			
	Research Rotations	Forum	Research	Forum	Forum	Research			
		Seminar		Seminar	Seminar				
		Journal Club		Journal Club	Journal Club				
		Research		Research	Research				
Benchmarks	Individual Development Plan			Update Individual Development Plan	Written Rigor of Prior Research	F31+Document and Oral Defense			
				Form Dissertation Thesis Committee					
				1 st committee meeting					
				Plan of Study					
	Year 3			Year 4			Year 5+		
	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer
Curriculum	Seminar	Seminar	Research	Forum	Forum	Research	Forum	Forum	Research
	Journal Club	Journal Club		Seminar	Seminar		Seminar	Seminar	
	Research	Research		Journal Club	Journal Club		Journal Club	Journal Club	
				Research	Research		Research	Research	
Benchmarks	Individual Development Plan			Update Individual Development Plan			Update Individual Development Plan		Dissertation Defense
	Annual committee meeting			Annual Committee Meeting			Annual Committee Meeting		
				Update Plan of Study if needed					

REGISTERING FOR CREDITS: To receive a stipend, students are required to register for a minimum of 9 credits for the fall and spring semesters and a minimum of 1 credit for the summer semester. Students may find it more cost effective to register for more credits during the summer session; a calculator for this is available on the Office of Graduate Education and Life website. Credit hours exceeding 16 require prior approval by the Associate Provost for Graduate Education of WVU.

Once candidacy is achieved, the student should register for at least one credit as a candidate in all semesters and summer sessions until they successfully defend. However, if a student is receiving a stipend, the student must be registered for a minimum of 9 credit hours per WVU policy in order to continue receiving their stipend.

VI. Work Schedule, Sick Leave, Vacation and Leave of Absence Policy

The PhD degree is awarded based on completion of original dissertation research, not on time served in the program. Undue time spent away from the University will hamper your progress in research.

A. Work Schedule

The first year of study focuses primarily on didactic education. In the fall semester, students can expect to follow the academic calendar of the University for the December holidays. During the week of Thanksgiving, University classes are not in session, but research is considered on-going. The student is expected to discuss their work schedule for this week with the faculty member with whom they are rotating. The same is true in the spring semester; students still rotating in laboratories should discuss expectations for spring break with the host mentor. Expectations vary between laboratories; students and mentors should discuss this at the beginning of rotation. Mentors are made aware of the guideline of approximately 20 h per week in the laboratory during the short rotations (Biomedical Lab Experience). For safety, students should avoid working in the laboratory alone.

B. Sick Leave

Graduate students do not receive a specified number of sick days per pay cycle or calendar year. Absenteeism from classes, graduate program activities and the laboratory should be reserved for true illnesses that are contagious or injuries that significantly block the ability to function. Time lost to mild (non-communicable) diseases should be minimized. The student's responsibilities remain the same and missed work will need to be made up possibly by working weekends and evenings. Absenteeism from classes and other events needs to be communicated to each faculty member coordinating a class or event.

C. Vacation

Once a student enters a specific graduate program, the vacation schedule for the University calendar no longer applies. Expectations regarding vacations need to be discussed with the

mentor. These expectations are likely to vary among research laboratories, so it is important to establish these expectations upon entry in the laboratory.

D. Leave of Absence

The Health Science Center has a defined policy to deal with extended periods outside of the laboratory or class, generally greater than 2 weeks. Termed a leave of absence, a student may need to take such a leave due to issues, such as grave illness, pregnancy or family crisis. Students should consult this policy * (<https://sole.hsc.wvu.edu/>): Health Sciences Center Graduate Programs SOLE site...Content...FORMS-HSC Graduate Students when considering such a leave. In some circumstances, the leave may be imposed upon the student administratively due to academic issues or policy violations. Procedures for this are detailed in this policy, and there are forms for documenting all types of leave and any expectations or requirements upon the student's return.

Grading and handling of courses during a leave of absence

When a student goes on a leave of absence, issues develop regarding the grading of courses when the leave begins mid semester. Largely, this will need to be handled on a case-by-case basis. For defined courses, the student will need to work with the instructor to come up with a strategy and generally will need to take an "I" (Incomplete). Courses like research and seminar (when used to monitor attendance) generally do not have a mechanism to fulfill an incomplete. If the length of the leave is known and it is before the deadline to withdraw, it would be best for the student to withdraw from these courses during the semester. If that deadline has past, a student in good standing should be able to receive a grade reflecting their participation prior to the leave, especially when the course is graded S/U (Satisfactory/Unsatisfactory) or P/F (Pass/Fail). Journal clubs can be handled by having the student write summaries of papers that were missed. If the student is having a major medical crisis and cannot work during the leave, then the student should be graded for the time in the course or given an incomplete and a protocol developed for making up missed work.

VII. Academic and Professional Standards

A. Academic Standards

1. Standards

It is expected that students will perform satisfactorily on all required courses. To remain in good standing in the PhD program, a student is required to maintain the following standards:

- An overall grade point average of 3.0 in graduate level coursework. Note that this is higher than the university standard of 2.75;
- Removal of any incomplete grades within one semester or summer session of receiving it, unless special permission is granted by the Assistant Vice President

- for Research. Failure to remove an incomplete within one semester results in a permanent F on the student's transcript and this F figures into the GPA; and
- Satisfactory written comments describing the student's performance in short rotations.
 - Students have one semester to raise their overall GPA to 3.0 or higher.

Failure to comply with these standards will result in the student being placed on academic probation and may result in dismissal from the graduate program.

2. Grading System and Reporting of Grades

Graduate courses are graded as follows: A, B, C, or F, and P (pass) or F (fail). The course coordinator may submit letter grades with + or -, but the grade point average (GPA) is calculated using the basic letter grade. Grades of F are not acceptable for course credit toward a graduate degree but are used in calculating the GPA. Letter grades are given for the Biomedical lab experience (BMS 702; also known as rotations) in Year 1. Research NSCI 797 is graded S/U; U's in research are not counted for the calculation of the GPA. The first unsatisfactory (U) grade for NSCI797 results in placement of the student on probation; a second U in research NSCI 797 is grounds for dismissal from the graduate program.

The grade of Incomplete (I) is given when the instructor believes that the course work or other required programmatic activity is incomplete. All incompletes must be removed within the next semester of the calendar year; however, an individual instructor may require their removal within a shorter period. Students who receive an incomplete grade must contact the faculty member who issued the incomplete to discuss its removal. If an incomplete is not rectified within the next semester, it will be changed to a grade of F (IF).

NOTE: Students cannot graduate with an F grade on the Plan of Study. The course must be retaken and the grade brought into the acceptable range. Both grades will count toward the GPA on the transcript, and the higher grade will be placed in the Plan of Study.

B. Professional Standards

Graduate students in the seven Biomedical Graduate Programs, the MS in Biomedical Sciences, the MS in Health Sciences, and first year students in the Biomedical Science Graduate Program are expected to adhere to the following standards of behavior throughout their tenure in graduate school. This code governs student behavior in classrooms, research endeavors, academic and professional gatherings, travel and in their daily conduct outside of the University. In addition to the code outlined below, all students will uphold the WVU Student Conduct and Discipline Policy. This code can be found at: <https://studentconduct.wvu.edu/campus-student-code>

1. Academic Integrity

Student Expectations:

- Students will not plagiarize the work of others, either by directly copying that work or by summarizing the thoughts of others as their own;
- Students will not cheat on any examinations, on academic assignments and activities and will not provide unauthorized help to others during an examination or graded academic assignment;
- Students will not alter examination scores, answer sheets, other graded materials or their academic record;
- Students will adhere to the University policies on academic integrity, found at: (<http://catalog.wvu.edu/graduate/enrollmentandregistration/#academicdishonestytext>)

2. Scientific Integrity

Students will:

- Accurately report how experiments were conducted;
- Represent their best understanding of their work in their descriptions and analyses of it;
- Accurately describe methods used in experiments;
- Abstain from falsely representing the work of others as if it were their own;
- Adequately summarize previous relevant work in their publications;
- When acting as reviewers, students will treat submitted manuscripts and grant applications confidentially and avoid inappropriate use; and
- Disclose financial and other interests that might present a conflict-of-interest in their various activities, such as reporting research results, serving as reviewers and mentoring students;
- Adhere to the University Research Integrity Procedures that can be viewed at: https://oric.research.wvu.edu/files/d/a6c5bbb8-f806-489a-b16b-e0da5f81970d/research-_integrity_policy_amended_6-13-16_final-2.pdf

3. Scientific citizenship

Students will:

- Strive to provide timely, efficient and high-quality work;
- Function as an effective and respectful team member in the performance of collaborative research;
- Strive to always acknowledge the contributions of their co-workers;
- Strive to keep all work areas clean, organized and conducive to high-quality research;

- Respect shared work areas and reagents and ensure that steps are taken to replenish reagents when they are in low supply;
- Refrain from activities that might be disruptive to the work of others, including playing music, conversation and telephone calls;
- Be attentive in presentations by colleagues and provide constructive criticism as appropriate;
- Seek and accept criticism without reprisal or defensiveness;
- Strive to address and remedy situations as they arise and follow through on all promises and commitments to co-workers;
- Wear appropriate clothing in the laboratory and other research settings that is consistent with federal, state, and University regulations;
- Speak-up and report any practice, condition or situation that may cause harm or that is against federal, state and University regulations;
- When traveling as a representative of the University and laboratory, the student will behave in a professional manner, uphold the rules of the laboratory with respect to the sharing of data, report expenses in a truthful manner, and refrain from frivolous use of travel funds for meals or modes of transportation that are unnecessary.

4. Professional interactions

Students will:

- Strive to increase their knowledge and expertise to maintain qualifications consistent with the highest standards available in their discipline;
- Accept and adapt to the continual change inherent in the creation and delivery of knowledge;
- Be appropriate in dress, language, and demeanor and avoid language and dress that is offensive to others;
- Respect and protect the rights to privacy and confidentiality of all students, staff, faculty, study participants, and patients;
- Minimize personal text messaging, e-mailing, telephone calls, and social media while at work;
- Respond to all communications in a timely manner;
- Listen carefully and be thoughtful and respectful in all forms of communication and during the attendance of seminars;
- Provide training and experience to advance the scientific skills and knowledge of ethical research practices for any trainee under their supervision;
- Treat all individuals in a caring, respectful, professional, and empathic manner.

C. Graduate Programs Committee on Academic and Professional Standards (GP-CAPS)

1. GP-CAPS Membership

During the first year in graduate school, student compliance with these academic and professional standards is monitored by GP-CAPS. This committee has representatives from all seven Biomedical PhD programs and the clinical and translational science graduate programs. Following the first year, issues related to academic or professional standards are first evaluated by the program faculty and then for issues of dismissal or appeals by GP-CAPS.

2. Student Review and Appeals Policy

Students have the right to due process in all decisions regarding their grades, evaluations, and status in graduate school. Appeals regarding the above must follow a standard set of procedures. Procedures for student appeals can be found in the Graduate Catalog <http://catalog.wvu.edu/graduate/>

VIII. ADVANCEMENT TO CANDIDACY: RIGOR OF PRIOR RESEARCH AND F31+DOCUMENT AND ORAL DEFENSE

I. Advancement to Candidacy

Advancement to Candidacy is a process of validation by the Neuroscience Program Faculty that a student enrolled in the PhD program has acquired sufficient core knowledge and academic skills to initiate dissertation research leading to the PhD degree. This is demonstrated, in part, by obtaining a grade of B or better in the core Neuroscience coursework.

The Advancement process involves two separate activities:

1. The Rigor of Prior Research

This initial exercise has several goals, 1) it provides an opportunity for the student and the mentor to define research goals, 2) it will require the student to conduct a thorough literature review and determine whether important unanswered questions remain 3) it will provide an opportunity for the committee to evaluate the proposed dissertation project and the students writing.

The rigor of prior research should be written according to the instructions provided by the NIH for F31 applications. See below:

A careful assessment of the rigor of the prior research that serves as the key support for a proposed project helps to identify weakness or gaps in a line of research. NIH expects applicants to describe the general strengths and weaknesses in the rigor of the prior

research (both published and unpublished) that serves as the key support for the proposed project. It is expected that this consideration includes attention to the rigor of the previous experimental designs, as well as the incorporation of relevant biological variables and authentication of key resources. Applicants are expected to include plans to address any weaknesses or gaps identified. More information at <https://grants.nih.gov/policy/reproducibility/guidance.htm>.

2. F31+Document and Oral Defense

Successful defense of a proposal outlining the student's dissertation research marks the entrance to PhD candidacy. Timely completion of this benchmark not only provides a guide for the remainder of the research, but also provides an excellent springboard from which to apply for an external fellowship. The proposal defense begins with the preparation of a fellowship application in the style of a National Institutes of Health (NIH) F31. Portions of this grant application will be drafted during the Scientific Writing course. The proposed research will be presented in a formal seminar open to the faculty, graduate students and other interested people followed by an oral defense of the proposal to the student's dissertation committee.

The following sections must be included in the dissertation proposal:

1. Abstract and narrative;
2. Table of contents;
3. Biographical sketch;
4. Literature review – suggested 5-page limit;
5. Specific aims – at least 2 aims are recommended – 1-page limit.

It is understood that these aims may change over the course of the research just as they do for the mentor's grants. Likewise, it is not intended that every aim must be accomplished to complete the PhD degree. However, revisions to aims must be presented to and approved by the advisory committee.

6. Research Strategy – suggested 10-page limit;
7. Literature Cited (no page limit).

Each Aim should contain the following sections (length is per aim):

- A. Rationale (1 paragraph);
- B. Experimental plan and specific methods as appropriate (1-2 pages);
- C. Expected results (1/2 page).

A short section describing Alternative Approaches (3/4 pages).

Note: The page limits are for single-spaced type. The acceptable fonts are Arial, Helvetica, Palatine Linotype or Georgia and a font size of 11 or 12 points. The type density should be no more than 15 characters per inch and 6 lines per inch. One-half inch margins should be used on all sides but not greater than 1 inch. If the student chooses to convert this proposal to an actual fellowship application, they will need to consult the directions for the additional sections required by the NIH.

It is recommended that the proposal be defended in the Summer semester of the student's second year in graduate school. If the proposed defense is not successful, the student may petition his/her dissertation committee to revise the proposal and defend a second time. Successful defense of the research proposal must occur on or before the last working day of Year 2, which is usually the 3rd Friday in August. Failure to pass the defense by this date will result in dismissal from the graduate program. Students with extreme circumstances may petition for a delay in this deadline. The petition must occur in writing to the Assistant Vice President for Graduate Education and must include a strong rationale for the delay.

It is strongly recommended that students submit their F31 to seek a fellowship from a national funding agency. These include agencies, such as the NIH (F31, F31 diversity) and private foundations including the AHA, among others. Students who choose to apply for a pre-doctoral fellowship should consult the Health Sciences Graduate Programs site on SOLE for helpful hints and guides on how to construct this application.

IX. Dissertation Research, Dissertation Defense and Graduation.

With successful completion of the F31+Document and Oral Defense, the student advances to candidacy for the PhD degree and the 5-year WVU-mandated clock for completion of the degree starts. Note however, that the expectation is that the student will defend his/her dissertation within 5-6 years of entering the program. The graduate program director will recommend to the graduate council that the student be elevated to candidacy for the PhD degree. The committee chair (student's advisor) will submit to the Health Sciences Graduate Programs Office a completed Doctoral Preliminary Examination Form indicating the successful completion of the written and oral qualifying exam and a Doctoral Candidacy Examination Form indicating successful completion of the F31+Document and Oral Defense. The Plan of Study Form should also be completed and submitted to the Graduate Programs Office at this time. Copies of these forms can be downloaded from the (<https://sole.hsc.wvu.edu/>): Health Sciences Center Graduate Programs SOLE site...Content...FORMS-HSC Graduate Students.

1. Dissertation Research

Students will conduct research with a dissertation mentor during their time in the program. Students will register for research credits each semester. A research grade is determined each semester (including summer) by their dissertation mentor and committee and by completing program requirements in each semester.

2. Dissertation Defense

A. Students must have two published manuscripts, one of which must be based on their Ph.D. dissertation research as first author, published or accepted for publication in a peer-reviewed journal before they defend their dissertation research. In the case of joint first-author manuscripts, the manuscript can only fulfill this requirement for one author. This requirement should not be misinterpreted to mean that the student is necessarily able to defend once they have the required publications. The decision of when a student has completed the aims for their dissertation rests with the dissertation advisory committee. With some research projects, this will result in more than two publications.

- B. The form of the dissertation will be decided by the graduate advisory committee and must be consistent with the School of Medicine Guidelines for Theses and Dissertations, as well as the guidelines published in WVU's Graduate Catalog. A copy of the dissertation must be delivered to the advisory committee and the graduate office at least one month prior to the defense of the dissertation.
 - C. A Shuttle Sheet Request Form (<http://www.hsc.wvu.edu/media/7510/shuttle-sheet-request-form-and-process.pdf>) must be submitted to the Health Sciences Graduate Programs Office 2 weeks prior to the defense date to allow the Office of Research and Graduate Education sufficient time to process and communicate the Dissertation Defense to the University community.
 - D. The final examination for the PhD degree consists of:
 - i. Orally defending the dissertation in a public seminar and then in a closed session with the graduate dissertation committee;
 - ii. Final approval by the dissertation committee of the written dissertation;
 - iii. The committee will jointly decide if the student's oral defense has passed or failed. Separately, the committee will either approve the written dissertation as is, approve the dissertation with revisions, or refuse to pass the dissertation.
 - iv. If the dissertation is not approved, the dissertation should be rewritten and resubmitted within a deadline decided upon by the committee and approved by the graduate program office and the VP of Graduate Education.
 - v. If approved with revisions, the revised dissertation should be re-submitted to the committee (or to select members thereof) no later than 30 days following the dissertation defense.
 - vi. Final approval of both the oral exam and written dissertation will be conveyed by committee members signing the appropriate forms, which will also constitute permission to submit the dissertation to the WVU Electronic Theses and Dissertations (ETD) office.
- 3. Graduation Requirements: the following is a list of requirements for graduation.**
- A. 3.00 GPA, no D's or F's, and no U's in research;
 - B. Proper registration and payment of fees. Once candidacy is achieved, the student should register for at least one credit as a candidate in all semesters and summer sessions until they successfully defend. However, if a student is receiving a stipend, the student must be registered for a minimum of 9 credit hours per WVU policy in order to continue receiving their stipend. Credit hours exceeding 16 require prior approval by the Associate Provost for Graduate Education of WVU. Students can visit the Revenue Services website to learn more about the fee amounts for each semester (<https://revenueservices.wvu.edu/tuition-and-fees>).
 - C. Passage of the benchmark exams:
 - i. Rigor of Prior Research;
 - ii. F31+Document and Oral Defense (candidacy exam);
 - iii. A written PhD dissertation that is successfully defended in an open forum leading to the approval of both the oral defense and the written dissertation by the dissertation committee and subsequently submitted to the WVU Theses and Dissertations (ETD) office;
 - D. Annual reports of completion of the IDP and advisory committee meetings;

- E. Two manuscripts, at least one as first author based on the dissertation research (see above for journal requirements);
- F. Submission of required approval forms;
- G. Electronic submission of dissertation;
- H. Application for graduation and diploma Form; and
- I. Exit interview with Assistant VP for Graduate Education.

4. Deadline for completion of the degree

Students should complete their degree within 5 years of matriculating into graduate school provided they have demonstrated a strong work ethic in both academics and research. Students have a maximum of 7 years to complete their PhD from entry into the biomedical first semester curriculum to defense of their dissertation and submission of the dissertation to the Electronic Thesis and Dissertation repository (ETD), although the expectation is that students will complete their degree within 6 years. For example, a student entering in the Fall of 2020 will need to complete all program requirements by the end of summer session in August of 2027. Students who fail to complete the degree within this timeline will be recommended for a terminal MS in Biomedical Sciences Degree. In extraordinary circumstances, students can petition for an extension of the time to degree. This petition must be approved by both the graduate program director and the Assistant Vice President for Graduate Education. Only one extension will be allowed and will not exceed 1 year.

These time limits include students who have switched laboratories, as 7 years is still 2 years longer than the recommended 5-year timeline. Students entering their 6th year in graduate school will need to have committee meetings every 6 months in order to monitor progress. Failure to meet the committee meeting requirement may result in suspension of the student's stipend and tuition waiver until this requirement is met.

Notes:

1. This policy is in addition to the University timeline of 5 years post candidacy and in the case where the 7-year mark precedes the 5-year post candidacy deadline, the student is governed by the 7-year time limit.
2. Students who have a documented Leave of Absence can subtract the time during their leave of absence from the 7-year deadline.

X. FastTrack Admission Process into the Neuroscience Graduate Program

An accelerated track for entry of Biomedical Sciences (BMS) matriculants directly into the Neuroscience Graduate Program (NGP) and accelerated progression to degree (FastTrack). This program is targeting students enrolled in the Neuroscience undergraduate program at WVU who are interested in pursuing a PhD.

Goals:

- Accelerate time to degree by reducing didactic instruction and accelerating the dissertation project
- Provide a unique and attractive opportunity for strong WVU undergraduate students
- Attract and retain highly trained Neuroscience undergraduates to the WVU Neuroscience Graduate program

Participating Programs

- Students in the Neurobiology Track of the Biology major at WVU
- Students in the Neuroscience major at WVU
- Students in the Behavioral Neuroscience Track of the Psychology major at WVU

A key component of FastTrack is a very strong undergraduate program at WVU providing the students with the academic background in neuroscience and the opportunity for extensive research experience in the future dissertation mentor's laboratory.

Student eligibility: students must have sufficient academic background in Neuroscience to "pass out" of the first-year curriculum AND have made sufficient accomplishments in the laboratory to begin their dissertation research.

Requirements for admission to the FastTrack program (NGP program) –

1. Coursework

- A degree in Neuroscience-related major at WVU (GPA > 3.5)
- Bio 386 or Bio 486 or equivalent course in neuroscience or psychology major
- Completion of science electives outside their discipline to meet the breadth requirement
- A writing course such as BMS 720
- Neuroanatomy Course (NSCI SPTP 493A)

2. Research Experience

- Have at least one year of research experience (time commitment per semester similar to 497-level course in the Neuroscience Electives) in a neuroscience research laboratory and demonstrated ability in techniques required to develop a project for a dissertation.

3. Mentor

- The proposed dissertation mentor must be on the available mentors list in the HSC at the time of matriculation to graduate school.

4. Dissertation Advisory Committee

- Prior to matriculation, the student should form and meet with a research advisory committee, to receive additional guidance on the development of their project.

Application process –

1. Students must be admitted to the BMS program by the Graduate Program Admissions Committee for Biomedical Sciences - intent to apply to FastTrack shall not be a consideration for admissions by this committee
2. Upon admission by the Graduate Program Admissions Committee for Biomedical Sciences, students meeting eligibility requirements will be considered for FastTrack by the Neuroscience Graduate Program Committee.

Requirements for graduation: FastTrack Neuroscience graduate students will have the following requirements for graduation with the exception noted from the standard track NGP students:

- BMS700 Scientific Integrity (1 credit)
- BMS701 Scientific Rigor and Ethics (1 credit)
- BMS707 Experiential Learning (2 credits)
- BMS720 Scientific writing (2 credits)
- 2 advanced courses (700 level, number of credits variable)
- NSCI 761 Journal Club (1 credit): every semester for first 3 years
- NSCI 760 Neuroscience Forum (1 credit): every semester in the program
- NSCI797 Research (credits as needed): every semester in the program
- NSCI 770 Fundamentals of Neuroscience I (6 credits)
- NSCI SPTP 793A Functional Human Neuroanatomy
- Successful completion of the Rigor of Prior Research
- Successful completion of the F31+Document and Oral Defense
- Successful completion of the dissertation defense
- Publish at least one first-authored and one junior-authored manuscript in a peer-reviewed journal

The following exceptions will apply for the FastTrack NGP students:

- BMS747 Foundations in Biomedical Research I: Not required
- BMS777 Foundations in Biomedical Research II: Not required
- BMS706 Cellular Methods: Not required
- BMS702 Laboratory rotations: Not required

In the FastTrack program, students will meet curriculum milestones one year in advance of students in the regular track. This is anticipated to accelerate progression to degree.

I have read, I acknowledge, and I agree to abide by the provisions of this Neuroscience Handbook.

Name

Signature

Date