



HANDBOOK FOR THE MASTER OF SCIENCE PROGRAM IN THE BIOMEDICAL SCIENCES



2018/2019 Academic Year

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I. GOALS AND OBJECTIVES OF THE PROGRAM

The M.S. program in the Biomedical Sciences provides a strong foundation in the basic sciences and training in biomedical research to assist students in achieving their occupational objective. Potential career paths for students with an MS in the Biomedical Sciences are:

1. job placement in industry, pharmaceuticals, biotechnology
2. technician in a research laboratory or core facility
3. teaching, patent law, scientific writing
4. investigating a desire to pursue the Ph.D. degree
5. enhancing academic and research credentials for acceptance into a Ph.D. program

To achieve these objectives, the proposed coursework provides the same core foundation knowledge common to first-year curricula in biomedical Ph.D. programs. The coursework uses the same core courses taken by the Ph.D. students in the Biomedical Sciences at WVU and thus provides the M.S. student with potential for advance standing should they choose to apply to WVU. In addition, the M.S. program provides laboratory training for positions in industry or as a technician or laboratory core employee.

The M.S. in Biomedical Sciences offers 2 routes to completion. The Plan A degree involves the completion of a research thesis and is the most desirable route for the individual who wants to demonstrate research proficiency. A Plan B route is also available and involves more coursework and less bench research. Students in this route write a paper summarizing a body of knowledge and their research experience but this experience would be less extensive than a thesis. This route is more acceptable for students pursuing a non-research career.

In addition to the information contained in this handbook, the student is urged to also consult the current Graduate School Catalog for additional information regarding the requirements of all graduate students at West Virginia University.

II. Office of Research & Graduate Education

The Assistant VP for Graduate Education, and staff assistants are part of the HSC Office of Research & Graduate Education. The following will interact with you most on programmatic issues. Please meet the others on our website: <http://www.hsc.wvu.edu/resoff/home/>

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NOTE: The University and our Office will communicate with students only via WVU MIX email address. We will not use other email addresses. The MIX account must be activated. If the student does not exclusively use his/her MIX email account then the email must be configured to forward to the preferred account. Periodic checking of the MIX account will not suffice and students will be accountable for any missed communications. MIX email addresses do not expire. It is recommended that students continue to keep this account active after graduation for receipt of information related to their status as alumni.

III. ADMISSION INTO THE M.S. PROGRAM

A. Traditional admissions

Prospective students must have an earned bachelor's degree from an accredited university with an overall GPA of at least 3.0 and completed all recommended prerequisites:

1. Biology or related coursework
2. Chemistry, inorganic and organic
3. Physics
4. Mathematics through calculus

Depending on the intended area of emphasis, students lacking one of these prerequisites can remediate that work through taking the relevant courses concurrently with the M.S. curriculum or during summer session.

Applicants must complete the Hobson's online application and submit the following:

1. official transcripts from all undergraduate and graduate institutions attended,
2. official GRE scores,
3. TOEFL scores, if applicable,
4. personal statement describing the applicant's reasons for pursuing graduate work in science, career goals for which this masters will be used and skills that you feel you already have that make this a good career for you,
5. three letters of recommendation from individuals who can evaluate your academic credentials and potential for a scientific career.

Under certain circumstances, the admissions committee may waive the GPA requirement.

Applicants will be evaluated for acceptance into this program by an Admissions Committee composed of representative from each of the 7 biomedical graduate program. Review of applications will begin on Feb. 1 and proceed until all slots are filled or suitable candidates have been identified. Pre-selected students may be invited for a visit/interview in conjunction with the recruitment visits for Ph.D. candidates.

B. Non-traditional route for admission to the M.S. program

In some circumstances, a student in one of the 7 Ph.D. programs in the Biomedical Sciences may request or be recommended to leave the Ph.D. track and compete the M.S. in Biomedical Science. Approval to do so comes from the Graduate Director for the Ph.D. program the student is leaving and the Director of the M.S. in Biomedical Science. The student must meet the academic standards of the M.S. program. They must also fulfill any unfinished requirements of the M.S. program prior to graduating with this degree. For instance, if the student has not yet defended their dissertation proposal, they will need to write and defend a thesis proposal or complete the requirements for a Plan B M.S. (see below). If the student has completed the dissertation proposal, they must set up a meeting with their advisory committee and present a proposal for the portions of this work that will constitute the thesis.

C. Stipend and tuition support

Stipend support and tuition waivers for MS in BMS students are not provided by the Office of Research and Graduate Education. Once in a laboratory for their thesis research, the faculty mentor may choose to provide stipend support in which case the student also receives a tuition waiver. Students are also welcome to find teaching assistantships elsewhere in the University such as the Departments of Chemistry or Biology.

IV. Orientation

Graduate studies start with a seven-day program known as Boot Camp that prepares them to successfully transition into graduate studies, provides time to interact personally and at social events with faculty and resident students, and for team building activity. The objectives of the Boot Camp experience are for the student to be able to:

1. Decipher the experimental design of a journal article
2. Present a figure from a journal article
3. Actively participate in a journal club
4. Describe expectations on performance in research
5. Obtain journal articles when not within the WVU computing system
6. Use SOLE to obtain course information and graduate program information
7. Know when and how to use the Carruth Center
8. Work in a laboratory in compliance with Federal and WVU rules
9. Know how to make effective figures for presentations.
10. Demonstrate good oral presentation skills
11. Describe the purpose of the IDP, take the survey, convey the results to their mentor, and make plans for the future to improve their skills.
12. Describe the factors that play into establishing a good reputation in science
13. Handle experimental animals and operate in the animal quarters in compliance of federal and WVU rules
14. Join LinkedIn and the WVU Biomedical group

In addition, the students should have met and interacted with both their faculty and student advisors.

V. PROGRAM ACTIVITIES

At the time of entry, students will complete an individual development plan (IDP). This plan was developed by a team of scientists and is available nationally through the American Association for the Advancement of Science (myidp.sciencecareers.org). The student will review the results of this survey with a faculty advisor and register for the relevant coursework and activities. The IDP is reviewed annually with their thesis advisor. The degree is designed to be completed in 2 to 3 years.

A. Core Coursework:

The total credits for the degree are 41. Students in plan A take a minimum of 24 credits of coursework (including journal clubs and seminars) and 17 credits of research. Students in plan B take at least 33 credits of coursework and 8 credits of research. All students take the same course courses in the first semester. In depth knowledge in a specialized area is achieved by an elective of the student's and advisor's choice in the second year.

Courses	Code	Plan A Credits	Plan B Credits
First Year:			
<i>Fall Semester</i>			
Foundations for contemporary biomedical research	BMS 747/777	8	8
Cellular Methods	BMS 706	1	1
Discussions on Scientific Integrity	BMS 700	1	1
Biomedical lab experience (3 - 5 week rotations)	BMS 702	2	2
<i>Spring Semester</i>			
Molecular Genetics	BMS 715	3	3
Discussions on Scientific Integrity	BMS 700	1	1
Program-specific Elective	*	3	6
Journal Club	%	1	1
Research	BMS 797	1#	1#
<i>Summer</i>			
Scientific Writing	BMS 720	2	2
Research	BMS 797	1	1
Second Year:			
<i>Fall Semester</i>			
Program-specific Elective	*	3	4@
Journal Club	%	1	1
Research	BMS 797	5	4
<i>Spring Semester</i>			
Program-specific Elective	*	0	3

Journal Club	%	1	1
Research	BMS 797	8	5
Summer			
Research	BMS 797	3	3

- Elective courses should complement the student's choice of project and area of interest. This selection is made with the advice of the student's advisor.
- %Students enroll in a journal club consistent with the topics of the laboratory they have chosen.
- #To be a full-time student, total credits for the semester should be at least 9 and for the summer should be at least 3.
- @Plan B students need a total of 9 credits of coursework (courses and journal club) during the second year to reach the required 33 credits. If a 4-credit course is not taken, the student will need to take an additional course.

Courses:

Foundations for Contemporary Biomedical Research 1 and 2

The purpose of these courses is to impart a fundamental understanding of the functional components of a cell, and the basis for regulation of cellular processes and organ systems. The knowledge base is developed in an interactive faculty-student environment that requires interpretation and rational speculation to apply general concepts to specific situations and stimulate creative scientific thought.

Objectives

- Impart a fundamental knowledge base
- Integrate molecular, cellular and physiological concepts
- Illustrate relevance through clinical examples
- Illustrate current relevance via the literature
- Stimulate student engagement and critical thinking

Assessable Skills

- Understand important concepts, their significance and illustrate mastery with examples.
- Apply the conceptual principles discussed to novel situations.
- Design and interpret experiments to test molecular, cellular and physiological mechanisms.
- Verbally articulate understanding of concepts during scientific discussion(s).
- Demonstrate teamwork and problem solving.

Cellular Methods

The goal of this course is to familiarize the first year Biomedical Sciences students with current technologies found in the literature but also typically used by students in the biomedical programs. The lectures in this course are presented by graduate students and postdoctoral associates at the Health Sciences Center. It provides a teaching opportunity for these trainees and this type of teaching is particularly germane to trainees considering a career in industry where they may need to give presentations on new instrumentation or techniques.

Objectives

The students will be able to:

- Compare and contrast available techniques that are best suited for addressing a particular research inquiry
- Describe the basic steps used in a particular technique
- Be cognizant of the limitations of those techniques

Discussions on Scientific Integrity

Graduate students at West Virginia University are required to meet particular federal and University-wide standards regarding the responsible conduct of research (RCR). To meet these standards, all graduate students undergo this training during the first 2 semesters at WVU. This course covers the required subjects specified by the National Institutes of Health (NIH). In addition, students must complete an online RCR course offered by the Collaborative Institutional Training Initiative (CITI). CITI training can be completed at any time after registering for classes but it must be completed within 30 days of the beginning of the initial semester- the passing grade is 80%. Failure to do so may affect the student's ability to continue in the laboratory.

The Office of Research Integrity and Compliance (ORIC) will publish a training list derived from the CITI website database of those who have taken the training. This list will be published daily on the ORIC website (<http://oric.research.wvu.edu>) in the "Training Lists" section. To remain in compliance with NIH standards, students will need to retake the CITI training every 3 years that the student is active in research at WVU.

Biomedical Lab Experience

The objectives of this course are to:

1. Select a faculty mentor to guide their thesis research
2. Compare the research area of other laboratories in the Health Sciences Center so that the student can interact scientifically with the members of that laboratory
3. Identify research expertise of other laboratories in the Health Sciences Center so that the student can interact scientifically with the members of that laboratory.
4. To select faculty members for the student's dissertation committee.
5. Describe and apply new techniques for biomedical research to the student's scientific research.

Prior to the orientation boot camp, incoming students receive a list of faculty available for rotations and a description of their research. During boot camp, time is allotted to meet these faculty. In addition, MS students may work with other faculty at the Health Sciences Center with approval from the Assistant Vice President for graduate education. In general, rotations start on Monday of the first full week of classes and end prior to exam week. Students should expect to work the Monday and Tuesday of the week of Thanksgiving. Students who have not matched with a dissertation mentor by December of Year 1 will enroll in this course in the spring semester and conduct rotations until a match is finalized. The appendix contains the sample

evaluation form for this course. Unlike the PhD program, MS students do not need to complete 3 rotations if they have found a faculty member with whom to do their thesis research after either the first or second rotation or before entering the program. Students who are not completing a thesis, still need to identify a faculty member for their research experiences leading to the Plan B summary paper.

Scientific Writing

This course is divided into 2 parts. The purpose of the first part of the Scientific Writing course is to introduce students to scientific writing using a standard journal format and a simple set of data. Students may use their own data or a sample data set that will be provided to write a paper based on the format used in the Journal of Neuroscience. Although, not all students will submit manuscripts to this journal, it provides a relatively straightforward structure and format that can be generalized to other journals. The background, details, methods, and data analysis in the paper will come from the student's own research area and will be evaluated by their mentor.

The purpose of the second part of the Scientific Writing course is to introduce students to the grant writing process using a standard NIH predoctoral grant application format and a simple set of preliminary data. Students write the scientific portion of a grant proposal based on the format used by the NIH for a Ruth L. Kirschstein National Research Service Award (NRSA) Predoctoral Fellowship (F31). The scientific details in the grant application will come from the student's own research area and will be evaluated by their mentor. For students completing a thesis, this can then be used in a defense with their committee – see section VI.B.

B. Research:

The Masters in Biomedical Science requires the student to plan and conduct research to test a novel hypothesis or question. This research will be reported in a written thesis and defended (Plan A) or a summary paper (Plan B) followed by an oral exam. Note that the number of credits does not necessarily reflect the amount of time to be spent conducting research. The degree is conferred based on completion of the project and not time in the degree program. Thus, students are advised to use their time in the laboratory wisely and efficiently.

Research Plan A: In the Fall semester of Year 2, the student will meet with their graduate advisory committee (see section V) to describe and defend the proposed topic for their research. In preparation for this the student will prepare a document outlining the aims of the project and the planned approach. The format for this document is as follows:

1. Aims of the project – 1 page or less; describe in brief the hypothesis or question to be addressed. This is similar to the aims page of a dissertation proposal for the Ph.D. degree or for a grant application.
2. Background information – 3 pages; here, the student will provide sufficient information for the committee to understand the rationale for the hypothesis or question and any other background information that would be needed to understand the approach.
3. Experimental approach – 3 pages; this section describes the experiments that you will perform in order to answer the question or test the hypothesis. Sufficient detail

should be provided to convince the committee that you know what you plan to do and how to do it. With each approach, include the rationale for using it, the expected results and any anticipated problems.

4. References
5. Attach your biosketch in NIH format.
6. The document should be single-spaced, using Arial font, size 11 or 12 and the margins must be greater than ½ inch.

This document should be given to the members of your committee two weeks prior to the meeting. At the meeting you should prepare a talk with slides in which you describe the project including the background information that drove your hypothesis. Failure to defend the M.S. research proposal by June 30 of the second year in graduate school will result in dismissal from the program.

Research Plan B: Students in the Plan B track still complete a research project(s) but it will not have the breadth of a thesis. In the fall semester of their second year, the student should meet with their advisory committee and discuss the scope of the project that will be completed. The student should prepare a 2-3 page document that indicates the questions to be addressed, the skills to be learned, and any how this fits in with their long term career goal. This document should be given to the committee members, one week before the scheduled meeting. If a student has been in the thesis or PhD track and is changing to the Plan B MS track, this meeting will more likely reflect a discussion of work accomplished to date and plans for the remaining time in the degree.

C. Other Program Activities

1. Seminars and Journal Clubs

In addition to formal course work in the first semester, students will attend weekly seminars and journal clubs. During each rotation, the student will attend the seminars and journal clubs that are attended by the members of their host laboratory or as recommended by their host mentor. Students are welcome to attend additional seminars that are of interest but they should be keenly aware not to spend undue amounts of time in seminars at the expense of getting to know the laboratory and completing assigned laboratory work. Once the student has joined a laboratory, they should attend seminars and journal clubs consistent with their research area.

2. 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

This information will be used to build the necessary skill set and to help in decisions regarding future career options. It also provides a forum for the student to have more productive meetings with their advisor to help in the conduct of their research. The role of the dissertation mentor is to help the student to either achieve these skills. The IDP is to be reviewed annually.

The Biomedical graduate programs use a series of 3 IDP forms based on year in graduate education. All incoming Biomedical students will complete the Year 1-IDP and discuss their results with a faculty advisor during Boot Camp, the week before school starts. Once the student joins a laboratory, he/she is to review the IDP with the dissertation mentor. The IDP is reviewed annually and the form is placed in the student's file in the Office of Research and Graduate Education. MS students will use the Year 2-IDP at the beginning of their second year but need not use the Year 3 plus as this is specific to PhD students.

VI. Advisory committee

A. Selection of the committee

The advisory committee should be selected and approved early in the spring semester of the first year. The advisory committee has no fewer than 3 members; the majority of which have full graduate faculty status. It is recommended that one member reflect a discipline distinct from the research to ensure that the student can present their work to a broader audience. The chair of the committee is the research advisor unless they do not have full graduate faculty status; in this case, the advisor and student can ask another committee member to serve in this role. If a student was previously enrolled in the Ph.D. program and had an existing committee with 5 members, they may retain this committee or they may drop one member. The member that is being dropped must consent to their removal. Note that there are forms both for establishing the membership of the committee and for making changes to the committee membership.

B. Schedule for Committee Meetings

The suggested schedule and activity for committee meeting is as follows:

1. Late Spring of first year – approval of the plan of study, review goals for MS and basic plans for research or project (both plan A and plan B)
2. Fall semester of year 2 (plan A) – defense of thesis proposal. This meeting starts with a seminar style presentation of the project background and the student plans followed by a defense style question and answer period.
3. Spring semester of year 2 (plan A and B)- progress on thesis (plan A) or research activity (plan B). The student should provide an update on their plans for completing their work and graduation.
4. Summer of year 2 (plan A and Plan B) – defense of thesis or presentation of review paper and oral exam.

5. Students who are not ready to defend at the end of year 2 should have committee meeting in both the fall and spring of the third year to provide updates on their progress.

Each committee meeting should be documented by the evaluation form or method used by the graduate program with which the research advisor is affiliated and most comfortable. A minimum of 2 meetings is required for graduation.

VII. Work Schedule, Illness, Vacation, and Leave of Absence Policy

The MS degree is awarded based on completion of original dissertation research and not 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 still going on. 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 the rotation. Mentors are made aware of the guideline of approximately 20 h per week in the laboratory during the short rotations. For safety, students should avoid working in the laboratory alone.

B. Illness

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 completely block the ability to function. Headaches and small malaises should not be used as reasons to not be in class or lab. 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 laboratory, 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 Sciences Center has a defined policy to deal with extended periods of time 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 grave illness, pregnancy, or family crisis. Students should consult this policy

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, whether less than 1 month or a longer leave without stipend, issues develop regarding the grading of courses when the leave begins mid semester. To a large extent 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. 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 or P/F. 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 can't work during the leave, then either grade them for the time in the course, or give an incomplete and come up with a protocol for making up the work.

VIII. Academic and Professional Standards

A. Review of Student Performance

Students must be evaluated each year for performance in alignment with the academic standards listed below and any additional standards specific to their degree program. This evaluation can be solely by the dissertation advisory committee or can also include a general program review of student progress. The evaluation must be documented in writing, include the student's signature, and be placed in the student's file on SOLE.

B. Academic standards

1. Standards

It is expected that students will perform satisfactorily on all required courses. To remain in good standing in the MS 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 their award, 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.

- Satisfactory written comments describing the student's performance in short rotations, in research, and in general graduate program interactions throughout their tenure in the PhD program.

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. Note that unsatisfactory written comments, alone, are sufficient to result in academic probation and/or dismissal.

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 short lab experience in Year 1. Research 797 is graded S/U; U's in research are not counted for the calculation of the GPA. The first unsatisfactory (U) grade for 797 results in placement of the student on probation; a second U in research 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 time 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 (designated IF on the transcript).

Student who fail to have the required annual dissertation advisory committee meeting, or more frequently is requested by the program or committee will be given an I for research 797.

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. Students should be aware that WVU will not allow a graduate student to graduate with a GPA below 2.75. Thus, recovering from an F even if the student repeats the course is very difficult.

C. Professional Standards

Graduate students in the 7 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 and 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:

http://campuslife.wvu.edu/office_of_student_conduct

1. Academic Integrity

Students will:

- not plagiarize the work of others either by directly copying that work or by summarizing the thoughts of others as their own;
- 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;
- not alter examination scores, answer sheets, other graded materials, or their academic record;
- adhere to the University policies on academic integrity (<http://catalog.wvu.edu/graduate/enrollmentandregistration/#academicdishonestytext>)

2. Scientific Integrity

Students will:

- have actually carried out experiments as reported;
- represent their best understanding of their work in their descriptions and analyses of it;
- accurately describe methods used in experiments;
- not report the work of others as if it were their own;
- in their publications adequately summarize previous relevant work;
- when acting as reviewers, 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: <http://www.wvu.edu/~lawfac/mmcidiarmid/aic/Final%20RIC%20Policy%20WVU%205-9-11.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 insure 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, telephone calls

- be attentive in presentations by their 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 in order 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 at all times and avoid language and dress that is offensive to others;
- respect and protect all students', staff, faculty, study participants', and patient's rights to privacy and confidentiality;
- 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 empathetic 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 7 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 Appeals Policy

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

IX.. COMPLETION OF THE DEGREE

A.1. Defense of the thesis (Plan A)

Demonstration of mastery of their area of emphasis and ability to defend their thesis is the culmination of the degree. Once the thesis research is completed, the student will prepare a written document describing their results. The first chapter should be a literature review of 5 - 8 pages in length. The second chapter should report the results in the form of a manuscript. The defense of the thesis involves the presentation of a seminar in front of the faculty and students followed by a defense in front of just the student's committee.

A.2. Summary paper and oral exam (Plan B)

Students will summarize the results of the research project that they undertook. The format for this will be more varied than a thesis as the student will not have completed the test of a research question. A suggested format is to begin with a background section that summarizes the relevant literature on the topic followed by a description of the accomplishments beginning with the methodology used, any results obtained and a discussion (suggested length - 8-10 pages). Alternatively, the student and advisor may elect to have the student write a review paper on a topic approved by their committee. The student should present this paper to their committee two weeks prior to the scheduled meeting. The student will present a seminar to the committee summarizing their project or topic and demonstrate their knowledge on this subject by successfully answering questions from the committee. The successful student will demonstrate mastery of the area in which they studied.

Note for both Plan A and Plan B: A first-author publication is not required but a publication of any kind is highly recommended as this documents the student's accomplishments to employers or graduate programs.

B. Timetable for completion (from the University Catalog)

Master's degree students are permitted to continue in a program for a maximum of eight years under their original application. Students who have been inactive for two or more years, or who do not enroll for one year after initial admission, are required to apply for, and be accepted for readmission. The application fee is assessed for reapplication. Graduate work planned with the student's advisory committee (e.g., plan of study) must be satisfactorily completed within a period of eight years immediately preceding the conferring of the degree. A course taken more than eight years previously must be revalidated if it is to be used towards meeting degree requirements. Revalidation can be accomplished by submitting the following information for approval to the Office of Graduate Education and Life:

- A letter from the course instructor listing the criteria used to revalidate the course material
- A copy of the student's performance on the student's revalidation examination
- A letter from the college/school graduate coordinator and/or dean supporting the revalidation

C. Investiture/Commencement

Graduates can attend the investiture ceremony for the Schools of Medicine and Pharmacy. This ceremony held on either Friday, Saturday, or Sunday in the second week of May. The ceremony features the graduates of 7 of the Biomedical PhD programs, the PhD in Health Services and Outcomes Research, the PhD and MS in the Clinical and Translational Science programs, the MS in Biomedical Sciences program, and the MS in Health Sciences program. At this ceremony, the student's mentor places the MS or PhD hood on the graduate and the Ethical Affirmation for Scientists is recited. This oath was originated at WVU and was published in the journal, *Science*, in 2003. Graduation for the 2019 year will be with all programs at the Health Sciences Center and involves the actual conferral of the degree.

D. Admission to one of the 7-biomedical Ph.D. programs

Upon successful completion of the M.S. degree or during the course of the M.S. curriculum, the student may decide to pursue a Ph.D. If the student has completed the M.S. degree and graduated, then they will need complete the full University admission's application. If the student intends to enter a specific graduate program, the program code should be selected, otherwise the BMS code can be used. Applications to a specific program will be reviewed first by that program and then by the BMS admission's committee. Successful completion of the M.S. degree does not guarantee admission to the Ph.D. programs.

For student who wish to transfer to a Ph.D. without completing the M.S. degree, they must have completed at least one semester in the M.S. program and they must prepare an application packet (not a formal University application) with a personal statement, CV, transcript, and letter of recommendation from their advisor. The application packet will be reviewed first by the specific program that the student wishes to join and then by the BMS admission's committee. Advance standing may be desired because of the overlap of the curricula for the M.S. and Ph.D. programs and the University policy that only 12 credits can be used toward the new degree.

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WVU Health Science Center

Acknowledgement Form for entering graduate students

As an entering graduate student, I agree to review the policies and procedure published in the student handbook provided to me at orientation and available on-line as well as the additional information in the on-line Student Conduct Code listed below. I understand that I may seek discussion and clarification of these documents from the Assistant VP for Graduate Education at the Health Science Center. Please be sure to review these specific policies and sign each statement below.

Name: (printed or typed) _____ Date: _____

The Student Handbook for Graduate Students in the Biomedical Sciences Graduate Programs at the WVU Health Science Center.

I have read and understand the Handbook of the MS in Biomedical Sciences program at the WVU Health Science Center; both the information within this handbook and on-line catalogs and policies to which this handbook refers. These include but are not limited to:

- WVU Graduate Catalog (<http://catalog.wvu.edu/graduate/>), and
- Campus Student Code (http://campuslife.wvu.edu/office_of_student_conduct).

I agree to abide by the requirements outlined in this document as well as the University requirements governing these degrees.

Signature: _____

Academic and Professional Standards

I pledge to adhere to the Academic and Professional standards for graduate students (section VIII of this Handbook) and to maintain the highest standard of scientific integrity in all that I do.

Signature: _____

Federal, State, and University Requirements for Laboratory Conduct

I agree to adhere to all Federal, State, and University policies and requirements for the conduct of work in the laboratory. I will remain up-to-date on all certifications for both laboratory conduct and the responsible conduct of research.

Signature: _____

Syllabus

Biomedical Lab Experience – BMS 702

Offered Fall and Spring semesters
Credit hours - 2

Coordinator

Dr. Lisa M. Salati
2267 HSS
304-293-7759
lsalati@hsc.wvu.edu

Course Description:

Five week lab rotations within the laboratories of faculty affiliated with the biomedical graduate programs. They are designed for first year graduate students to gain laboratory experience and to pick a laboratory for their dissertation research.

Learning outcomes:

At the end of the course, students will be able to:

- Select a faculty mentor to guide their dissertation research
- Compare the research area of other laboratories in the Health Sciences Center so that you can interact scientifically with the members of that laboratory
- Identify research expertise of other laboratories in the Health Sciences Center so that the student can interact scientifically with the members of that laboratory.
- To select faculty members for the student's dissertation committee.
- Describe and apply new techniques for biomedical research to your scientific research.

Activities during the rotation:

The bulk of the time in the rotation is conducting experiments under the supervision of the laboratory principal investigator or his or her designee. You are responsible for keeping a laboratory notebook documenting your work and in compliance with federal standards. You will also attend laboratory meetings and read research articles and methodological papers relevant to that laboratory. You should also attend seminars and journal clubs that are attended by the members of that laboratory unless they are scheduled during the time of your other courses.

Research Profiles of Available Mentors:

Before Boot Camp, you will receive a booklet of one-page research profiles of the available faculty. The Office of Research and Graduate Education approves this list; occasionally faculty

will be added/deleted to/from the list over the course of the summer/fall due to changes in available funds. Please be prepared to identify at least three faculty with whom you would like to conduct a short lab experience and try and meet with them during Boot Camp.

How to choose your rotations:

During Boot Camp, you will have the opportunity to meet with the faculty who are approved to recruit a graduate student that year. This will be a brief introduction to them and their research. Use this time to identify faculty that you would like to meet with after boot camp and discuss their research and potential rotation projects in more detail. During the Monday and Tuesday prior to the start of classes, meet with your short list of faculty for the first rotation, to review their research in more detail. Note, that you and the faculty member do **not** make the decision of assigning you to a rotation in their laboratory. This is done by the Assistant Vice President for Graduate education. Faculty may indicate that they are unavailable for one of the rotations.

On the Wednesday after Boot Camp, you will submit to Dr. Salati the names of three faculty members (rank order) with whom you would like to rotate during the first rotation. While we strive to give you your first choice, we reserve the option to match you with your second or third choice based on competition with other first-year students for the same faculty mentor and research interests.

During the weeks after Boot Camp, each graduate program will hold separate “meet and greet” style sessions so that you can meet available mentors and learn about their research in more details, and you can learn about the different graduate programs.

Half-way through the first and the second rotations, you will be asked to once again submit three names for the second and third rotations, respectively. Once again meet with faculty to discuss research in more detail, if you have not already done so.

NOTE: Typically, only one student will rotate in any given laboratory during each rotation. Some faculty may host two students at a time, but do not assume that this will be possible.

NOTE: Due to time constraints with obtaining security clearance for rotations at NIOSH, please indicate your desire to do a rotation at NIOSH before or shortly after arriving at WVU. You must submit a security clearance form before conducting a rotation or dissertation research at NIOSH. It takes time to obtain a security clearance at NIOSH. Please be aware that a dozen or more people at NIOSH and CDC are involved in the submission and approval processes. Therefore, NIOSH staff request that only those students who are really interested in the research faculty at NIOSH submit this form. If you are seriously considering doing research at NIOSH, you will need to talk to NIOSH faculty for the proper form.

Policy on number of rotations:

All students should plan on doing 3 rotations regardless of how soon they are happy with a laboratory experience or their intent to work with a specific faculty member. This process is important in viewing different mentoring styles, meeting more faculty and students, and learning more about research at the HSC. In rare circumstances such as but not limited to, a long-term technician entering graduate school, rotations may be abbreviated or eliminated or the rotations may be with faculty who are not recruiting a student that year but may either collaborate with the lab or be a potential member of the student's dissertation advisory committee. The decision and the terms of that decision to permit a student to forgo or abbreviate rotations must be approved in writing by the Assistant Vice President for Graduate Education and placed in the students file.

How to select a dissertation mentor:

Please see your student handbook for more details on this. In brief, near the conclusion of each rotation, if you would like to consider them for your dissertation research, speak with the faculty member about potential topics for a dissertation. This discussion is only for information purposes and is not a promise that you can join and/or do that project. Do NOT ask them if you can join their lab, you have more rotations to do. It is possible that events can change over the course of the semester and/or they may feel you are not a good fit for the lab. They are NOT to make promises to you either; they could prefer another student rotating later in the semester. To be listed as a choice, you must have done a rotation in the faculty member's laboratory or demonstrated significant interaction during another rotation.

Schedule:

Choices for first rotation are due to Dr. Salati by 5 PM Wednesday, August 15, 2018.

Rotation 1: Monday, August 20 – Friday, September 21, 2018

Choices for second rotation are due to Dr. Salati by 5PM Friday, September 14, 2018

Rotation 2: Monday, September 24 – Friday, October 26, 2018

Choices for third rotation are due to Dr. Salati by 5PM Friday, October 19, 2018

Rotation 3: Monday, October 29 – Wednesday December 5, 2018

Choices for dissertation laboratory are due to Dr. Salati by 5PM Friday, December 14, 2018

Rotation 3 includes the week of Thanksgiving. Do not assume that it will be vacation for you. While classes are not in session this week, the University is open on Monday and Tuesday and many laboratories are in full operation. Discuss with the faculty member, if they would like you to work those days.

If you have not matched with a dissertation mentor by December/January of Year 1, you will conduct rotations during the spring semester until a match is finalized. Please discuss with your rotation host about conducting research during University spring break.

Attendance policy:

Before the start of each lab experience, you should meet with the faculty member and set up a daily work schedule keeping in mind the expectation listed below. At this time, you may also receive additional materials to read in preparation for your experiments. Remember, faculty members have

other obligations - do not wait until the last minute to meet with them. If you cannot be in the laboratory at the scheduled time you must contact the faculty member and the primary supervisor, if applicable. Absences should be limited to illness or another significant event. Inform your rotation mentor of exams that will alter your schedule; however, you are not to forgo laboratory work in the days before the exam in order to prepare for the exam. Expectations of the faculty are that you will use evenings and weekends for studying and that you will remain up-to-date in your coursework to prevent the need to cram before exams.

Expectations:

During the laboratory rotation, you will be expected to

- keep a regular work schedule in the laboratory,
- spend 12 hours per week actively engaged in experimental work or laboratory meetings, total time may be greater due to inactive periods during incubations, running gels, etc., such times can be used to study and read the scientific literature.
- read the literature pertinent to that laboratory.

By the end of the rotation, you should

- know what the major questions are for that laboratory,
- explain how your work fits into the goals of the laboratory,
- describe the assays you did including knowing the purpose for all steps and reagents,
- appropriately interpret your data, and
- know what the major pitfalls are in arriving at these interpretations.

IMPORTANT: You are to leave your laboratory notebook with the laboratory at the end of the short lab experience. The laboratory notebook(s) is the property of the laboratory. It should not leave the laboratory at any time. With permission of the laboratory mentor, you may make copies of the notebook for your personal use. Paper and notebooks for this purpose will be provided to you by each of the laboratories. The laboratory notebook should document your activities in sufficient detail so that your experiments can be repeated without your consultation.

Grading

Laboratory experiences are graded A, B, or C and include a narrative evaluation of your strengths and weaknesses by the rotation mentor.

The criteria for assigning a letter grade include keeping a regular work schedule as agreed upon at the start of the rotation, enthusiasm for research, understanding the research questions addressed by the laboratory, excellent work-ethic, reading the literature relevant to the laboratory research, conducting experiments in an appropriate and timely manner, analyzing the data, maintaining records in your

laboratory notebook of the experimental procedures and outcomes, summarizing and discussing results in the form of figures, tables, and text, and interacting well with others in the laboratory.

If you fulfill these criteria, you deserve an A. If you satisfy most of these criteria, you deserve a B, and if you do not perform up to these expected standards, you will receive a C. A grade of B or C is probably an indication that the faculty mentor is not interested in accepting you into the laboratory. A grade of C in graduate studies is considered failing, in practical terms. A grade of F is reserved for students with excessive absenteeism and/or flagrant violations of laboratory policy. The attached rubric is used by the rotation faculty in assigning a grade for that 5-week period. The 3 grades will be averaged for the course grade.

Evaluation Form - Research Rotation

Student name	
---------------------	--

Directions: Place a check mark next to the box that best describes the student's performance. The first box represents A level work, the second box - C and the third box - F. Circle areas in the box that need improvement to indicate B or D performance and provide written comments in the box below.

Research Skill

	Adept at following instructions, few mistakes, and mistakes are not repeated. Has excellent research skills. Has good common sense.
--	---

	Follows instructions but needs to ask frequent questions to get the protocol correct. Makes mistakes and the mistakes are sometimes repeated.
--	---

	Requires considerable follow-up to ensure correct procedures are followed. Mistakes are common and often repeated. Needs to be guided at every step.
--	--

Comments:

--

Citizenship

	Informs fellow research members when a research item needs to be reordered or replenished. Offers to replenish the item. Demonstrates tidiness. Does not interfere with the work of others. Research items are appropriately labeled and stored. Works well with others.
--	--

	Does not always inform fellow research members if a research item needs to be restored. Work area is left in reasonable shape. Some research items are labeled but needs prompting. Generally gets along with fellow research members but can be disruptive with chatting.
--	--

	Distracting in the research setting, with chatter or questions. Does not get along well with others. Is messy and research items are not properly identified.
--	---

Comments:

--

Research Notebook (or Alternative Record Keeping)

	Notebook is complete and neat. Anyone could reproduce experiments based on the record. Purpose for experiment and protocols are easy to discern. Data are neatly compiled, and results are summarized.
--	--

	Notebook is neat but lacks dates and page numbers. Protocols are summarized, but recipes or other details are missing. Data are listed, but conclusions are not summarized. Objectives for experiments are not stated.
--	--

	Notebook does not provide a resource for reproducing experiments. Protocols are lacking or incomplete. Data cannot be interpreted due to lack of labels. Conclusions are not provided. Notebook is messy and/or illegible.
--	--

Comments:

--

Intellectual Ability

	Student readily grasps the hypothesis to be tested and the rationale for the experimental design. Time between experiments is spent reading the relevant literature or researching the protocol. Student is able to coherently explain what they are doing.
--	---

	Student can explain what they are doing, but the hypothesis and rationale do not appear to be clear. Does some reading on own, but this area needs improvement.
--	---

	Student seems to be lost as to why they are performing the experiments and what the goal is for the laboratory. Spends little or no time reading about the laboratory topic or experimental approach.
--	---

Comments:

--

Work Ethic

	Student works the agreed upon schedule. Student informs the PI of absences. Student makes efficient use of all time. Student demonstrates enthusiasm for research.
--	--

	Student is generally present during agreed upon hours but absences are not always communicated. The student will leave even if the experiment is not complete. Student is seen surfing the internet and/or is late arriving. Student shows interest in research but lacks commitment.
--	---

	Student is frequently not present during agreed upon hours. Student does not communicate absences. Student wastes time and is frequently seen doing things other than research work. Student lacks interest in research.
--	--

Final Grade

	Grade	+/-
	A	
	B	
	C	
	D	
	F	

Additional Comments - please identify strengths and areas that need improvement.

--

Faculty Name	
---------------------	--



Long-Term Leave of Absence Policy Graduate Programs in the Health Science Center

1. INTRODUCTION AND DEFINITION

Under certain circumstances, graduate students may request or have imposed a long-term leave of absence (LOA) during which they are recessed without stipend from the program for a specified duration. There are several categories under which a student may petition for a leave of absence: medical, personal, and academic. In addition, an administrative leave of absence may be enforced due to serious academic or professional deficiencies.

A long term LOA is a period greater than 1 calendar month duration during which time the student is not engaged in significant productive activity toward the degree. The LOA may last up to 1 year. WVU policy is that students can only be inactive in their program for 1 year after which time they would need to reapply for admission.

2. POLICY

The request for the long-term LOA should be presented in writing to the Graduate Program Director and reviewed by the Program's faculty or subcommittee who will then recommend to the Associate Dean for Research and Graduate Programs (Dentistry, Nursing, Pharmacy and Public Health) or the Assistant Vice President for Graduate Education (Medicine) the terms under which the student may return to the program. Following the agreed upon time of absence, a student in need of more time in recess will be officially withdrawn from the program, unless the above administrative groups grant an extension because of special circumstances. Once withdrawn from the program, individuals must reapply for and gain admission to resume their studies. If a student fails to return from the LOA on the specified time and has not made any request for an extension, they shall be immediately withdrawn from the program. Reentry into the program will require a new application for admission.

3. TYPES OF LEAVE AND PROCEDURES

A. LEAVES OF ABSENCE WITHOUT STIPEND

1) Student-initiated leaves:

Medical LOA: This type of LOA is reserved for acute medical problems of a physical or mental health nature affecting the student or a first-degree relative requiring intense medical care. In order to return to the program, the student will present a letter of release from the treating physician clearly stating that they are fit to return to the rigors of a graduate program.

Personal LOA: This type of LOA is used for reasons of a personal nature affecting the student's ability to be successful in the program. These may include, but are not limited to requests regarding family-related issues unrelated to health, visa issues, or a reconsideration of career direction.

Academic LOA: This type of LOA is reserved for students who desire a recess from the program while currently unsatisfactory in a course prior to the issue of a final evaluation in that course. Student's leaving the program for this reason will have specific requirements for their return, which will generally involve successful remediation of their knowledge base. Return to the program will involve evaluation of the remediation as well as the entire academic record. Students who fail to successfully meet the criteria stipulated in the letter granting the leave may not be permitted to return. Should a student be permitted to return to the program, the Graduate Program will recommend if the student returns on academic probation or in good academic and professional standing. Students, who are recommended not to return to the program, must reapply and gain admission in order to resume.

Procedure: Request for a LOA must be initiated in writing. Student-initiated LOA requests use the Long-term LOA form. The student and the student's advisor (if applicable) should sign the form and present it to the Graduate Program Director. The request will be reviewed by the Program Director, Program Faculty and/or subcommittee and appropriate Dean. Upon acceptance of the request the student will be notified in writing and the letter will contain any applicable requirements for return to the program. Upon return to the program, the student presents any required documentation to the Graduate Director. Once the return is accepted, the Graduate Director signs the LOA form indicating that the leave is over. If a student chooses not to return from the LOA, they should submit a letter to the Graduate Director indicating this fact.

2) Administrative-initiated leave:

Administrative LOA: This type of LOA is imposed by the Graduate Director and/or appropriate Dean for that Graduate Program due to academic or professional deficiencies, such as failure to progress in research, inattention to the academic or professional standards of a graduate student, or unexplained absence from the program of greater than 1 week. This type of LOA will be part of the student's permanent record.

Academic LOA: This is the same as the student-initiated leave and is due to a deficiency in academic standing prior to the final evaluation in a course(s).

Procedure: The administrator (Graduate Director, advisor, Dean) initiates this request in writing. The LOA should indicate the reason for the leave, the length of the leave, and any requirements for return. LOA requests should be approved by the Graduate Director and appropriate Dean prior to presentation to the student. The student should sign the letter indicating that they understand the terms. Upon return to the program, the student presents any required documentation to the Graduate Director. Once the return is accepted, the Graduate Director signs the LOA form indicating that the leave is over. If a student chooses

not to return from the LOA, they should submit a letter to the Graduate Director indicating this fact.

B. LEAVES OF ABSENCE WITH STIPEND

Parental LOA: This is a LOA due to the birth or adoption of a child. Stipend should remain intact for the duration of the leave term as specified below.

- 6 Weeks for an individual
- 8 weeks total per family if both parents are enrolled in HSC graduate programs

Procedure: A specific form is not necessary for parental leaves of 6 or 8 weeks duration but the times frame should be communicated between the student and the mentor. If the mother has complications that require more time away than 6 weeks either before or after the delivery, a letter from the student's doctor is required documenting the amount of leave necessary. In general, a 2-week extension of this time will be granted. Longer periods than this will be handled on a case-by-case basis and depend upon the ability of the student to achieve significant progress toward the degree.

Other LOA: In some circumstances, the student may not be in residence in the program for greater than one month but may be able to achieve significant progress toward the degree. During this time, the student may remain on stipend.

Procedure: Such agreements should be documented in writing in letter format and include:

1. Reason for leave
2. Duration and timing of leave
3. Planned activities during leave
4. Planned method of communication during the leave

The letter documenting these conditions must be signed by the Graduate Director and placed in the student's file.

NOTES:

Extension of time in the program or to meet program-specific requirements: If the student is unable to complete the degree within the University time limit for attaining the degree, they may petition for an extension equal to the time of the LOA. Petitions must be presented to the Graduate Director in writing 6 months prior to the end of this limit and the graduate director should forward ones for consideration to the Assistant Vice President for Graduate Education. Petitions for extensions of other program specific activities such as candidacy exams, seminars, etc. should also be handled in writing and occur prior to the semester in which the activity is to take place.

Exceptions to the above: Programs that are accredited may have specific residency requirements and the rules of the accrediting agency supersede these institutional guidelines.



REQUEST FOR A LONG-TERM LEAVE OF ABSENCE

Date of request:

Name:

Graduate Program:

Type of leave:

- Personal
- Medical
- Academic
- Administrative

Person initiating request:

Date of the start of leave:

Date of anticipated return:

Reason for request:

Signature of student: _____

Signature of advisor: _____

Student Review Policy for Graduate Programs at the Health Sciences Center in the Biomedical, Clinical and Translational, and Health Sciences

This policy only applies to students enrolled in the following Graduate Programs:

Graduate Program	
Undifferentiated	1 st Year Biomedical Sciences
Masters	Health Sciences Biomedical Sciences Clinical and Translational Science
Doctoral	Biochemistry and Molecular Biology Cancer Cell Biology Cellular and Integrative Physiology Exercise Physiology Immunology & Microbial Pathogenesis Neuroscience Pharmaceutical & Pharmacological Sciences Pathway ¹ Clinical and Translational Science
Combined	M.D./Ph.D. Scholars Training Program ²

Each graduate program is responsible for monitoring the progress of its own students, identifying deficiencies, and recommending paths for remediation. Students receive evaluations on a semester basis through coursework and research grades, and at least annually via program review and for Ph.D. students, meetings of his/her dissertation advisory committee. Whereas individual programs may have unique expectations of their students, many requirements are common to all programs. The following review process is designed to encourage high standards of scholarship, integrity, professionalism, ensure due process, and provide opportunities for remediation. This process also recognizes and affirms the unique aspects of discipline-specific research training that is embraced by individual graduate programs.

¹PPS degree is awarded by the WVU School of Pharmacy

²only applies during the Ph.D. phase of the M.D./Ph.D. training program

Definitions

Candidacy exam: This is also called the defense of the dissertation proposal. This exam involves the preparation of a written document outlining the plans for the student's dissertation research. The document is written in the style of a fellowship application. The student presents a seminar to the faculty describing his/her plans and then meets separately with his/her dissertation advisory committee to defend his/her ideas. The student can retake this exam one time without consequence ([probation, demotion to MS or dismissal](#)). For Ph.D. students, the exam must be completed prior to the first day of class of the Fall Semester of their fourth year in graduate school; individual programs may impose an earlier deadline and this deadline is binding. For M.D./Ph.D. students, the exam must be completed by the end of the fall semester of the second year after beginning the research phase of their curriculum.

Dissertation mentor: This is the faculty member that is the advisor for the student's dissertation research. This individual must be a full member of the Graduate faculty and is either the principal investigator of the laboratory in which the research is conducted or is a collaborator of the scientist in whose laboratory the research is conducted.

Dissertation advisory committee: This is a group of at least 5 graduate faculty that oversee the progress of the student during his/her dissertation research. At least 3 members must be faculty from the student's graduate program. The student, in consultation with his/her dissertation mentor, selects the committee members. The committee meets at least annually. During these meetings, the student presents his/her research progress and plans for completion of degree requirements and post-graduation plans. The committee provides feedback on this and reviews the student's progress on the Plan of Study and his/her academic achievement. The results of this meeting are recorded on an evaluation form that becomes part of the student's file.

Graduate Programs-Committee on Academic and Professional Standards (GP-CAPS): is composed of biomedical sciences faculty from the HSC who hold regular membership on the graduate faculty and includes representatives from both the Schools of Medicine and Pharmacy. The Vice-President for Health Sciences Research and Graduate Education appoints the faculty to serve on GP-CAPS. The primary role of this committee is to ensure that student performance concerns are managed equitably and consistently across the graduate programs served by this policy.

Graduate program director: this is the faculty member responsible for coordinating the activities of the graduate program. The biomedical graduate programs have interdepartmental faculty membership; the [reformer](#) the Assistant VP for Graduate Education [provides administrative oversight of all the graduate programs](#), rather than a department chair.

Student's file: The student's file contains his/her application, transcripts, graduate forms, correspondence, and other relevant communications or notifications. The file is kept in duplicate with one copy residing with the graduate program and the second copy in the Office of Research and Graduate Education. Students are instructed to provide copies of all forms required for graduation.

Undifferentiated first year students: The 7 biomedical Ph.D. programs recruit students via an undifferentiated or umbrella admissions process. Applicants are screened and admitted by an admission's committee made up of representatives of all 7 programs. The students take a common first semester curriculum and do research rotations to choose a dissertation mentor. Once a dissertation mentor is selected, the student [requests admission to](#) one of the 7 biomedical graduate programs and from that point the student is governed by the handbook for the specific graduate program. Choice of mentor and graduate program occurs by the end of the fall semester or during the spring semester.

Probation, suspension and dismissal: Definitions of these terms can be found in the University Graduate Catalog. The exception to this is that the GPA requirement for the graduate programs [governed by this policy](#) is 3.0.

<http://catalog.wvu.edu/graduate/enrollmentandregistration/#probationsuspensionandtext>

Review of Graduate Student Performance

1. Documentation of Student Performance

- Student performance in graduate education is rated using the following measures:
 - Grades in classes.
 - Maintenance of a GPA of 3.0 or high
 - Performance on the Qualifying examination and the Candidacy examination
 - Performance in the conduct of research as evaluated by the dissertation/thesis mentor and the dissertation/thesis advisory committee
 - Performance in other curricular activities as evaluated by a faculty member, the mentor, or faculty/University committee overseeing that activity
 - Congruence of actions and behaviors both on and off campus to the WVU Student Code of Conduct (<http://campuslife.wvu.edu/r/download/180235>) or of professionalism (see relevant [handbook](#) for graduate program)
- Student performance in research is evaluated at the end of each semester and summer session and reflected in the grade in research provided by his/her mentor. This grade includes both the letter grade and written comments provided by the mentor and the evaluation of the student's dissertation advisory committee meeting.
- Student's overall performance is reviewed at least once per year annually by his/her dissertation/thesis advisory committee and by his/her graduate program. Performance of students in the first year of the 7 biomedical PhD programs, the MS in Health Sciences and the MS in Biomedical Sciences is reviewed semi-annually by GP-CAPS.
- Deficiencies in student performance can result in recommendations for remediation, disciplinary action, or both.

2. Performance That May be Subject to Disciplinary Action

- Unsatisfactory performance by a graduate student includes, but is not limited to:
 - inability to maintain a GPA of 3.0, or achieve minimum grades of "B" in required courses
 - inadequate research progress, as judged by the mentor or dissertation committee and documented in the advisory committee evaluation or written comments at the time a grade for research is assigned (even if the grade is S), or a grade of "U" in research (a combination of two "U" grades in research (xxx797) or dissertation (xxx798) is grounds for dismissal)
 - failure to complete benchmarks in a timely manner (i.e., qualifying exam, proposal defense)
 - reaching the limit on time to degree (5 years post the candidacy exam for Ph.D. students and 8 years total in the program for M.S. students)
 - poor attendance/participation as specified by graduate program handbooks or course syllabi at required program activities (i.e., journal clubs and seminars)
 - unapproved extended or multiple absences
 - violations of the WVU [Student Code of Conduct](#) (<http://campuslife.wvu.edu/r/download/180235>) or of professionalism (see relevant [handbook](#) or for Biomedical Science Students: <http://www.hsc.wvu.edu/resoff/graduate-education/phd-programs/biomedical-sciences/1st-year-handbook/#ProfessionalStandards>)

- Problem(s) must be brought to the attention of the graduate program director and documented in the student's file. Documentation can include:
 - an unsatisfactory grade on the transcript,
 - a letter from the student's dissertation mentor or another faculty member,
 - the evaluation report of the student's dissertation advisory committee meeting

3. Graduate Program Response to Unsatisfactory Student Performance

- Student notification: Within 5 calendar days of notification of the problem, the program director notifies the student in writing describing the unsatisfactory performance, measures necessary to correct the deficiency, and a timeline for correction. Note: This and all subsequent communication with the student are sent via email and the student must sign and return a copy of the letter to document his or her understanding of the concern/s and, if applicable, acceptance of conditions for remediation.
- Ascertaining student's side of the story: The program director meets with the student to ascertain his/her viewpoint on the problem and ability to correct the deficiencies. Any mitigating circumstances are noted and a written summary of this meeting, co-signed by the student, is placed in the student's personnel files.
- Determining the need for additional courses of action: The program director discusses the student's situation with the mentor and dissertation advisory committee, if formed, to determine if any additional courses of action are necessary. The student can be present at all or part of this meeting by the request of the program director, mentor or dissertation advisory committee. The student is informed in writing (via email) of the results of this meeting and is given the opportunity to provide more information or rebut the recommendation either in writing or in person. If the problem does not involve a gross infraction of University policy as defined by the WVU Student Conduct Code or the Office of Academic Integrity, the case generally does not proceed beyond the Graduate Program level. Likewise, sanctions excluding dismissal are handled at the Graduate Program level so long as the student accepts the remediation.
- Deficiencies that are not corrected within the timeline established in the remediation letter, and cases that result in recommendations for probation, suspension or dismissal are referred to the graduate faculty of the specific graduate program or subcommittee thereof.
 - Once a student has had his/her first meeting with his/her dissertation advisory committee, recommendations to dismiss the student should originate from this committee.
 - A minimum of three members of the student's dissertation advisory committee, including the mentor, and a representative from the HSC Office of Research and Graduate Education must attend the faculty meeting to assist in determining a course of action. Student may be asked to submit a written explanation, and/or to appear before the graduate faculty subcommittee.
- Potential outcomes of the Graduate Program Level Review are:
 - a penalty may be imposed, such as receiving a grade of zero for an examination
 - the student may be placed on probation, with requirements set forth in writing for the student to remediate deficiencies and remove probationary status
 - the student may be suspended from the program with specific directions on how to be reinstated
 - a Ph.D. student may be demoted to the Master's in Biomedical Sciences program

- the student may be removed from the training laboratory
 - the student may be dismissed from the graduate program; all program dismissals will be reviewed by GP-CAPS to determine if the student is dismissed from all programs in the Biomedical Sciences or if they can transfer to another program pending approval of that program and finding a mentor that will support their continued study toward the degree.
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- The program director reports all major infractions of institutional research procedures, [and all](#) recommendations for probation, suspension, or dismissal resulting from the Program Level Review, in writing, to the chairperson of the GP-CAPS. The report indicates the concern, the program faculty findings and actions/recommendations, and the student's response, if any. The student is provided a copy of this report and is given the opportunity to provide a written rebuttal of the letter and/or appear before GP-CAPS to explain his/her position.

Note: Plagiarism and other forms of academic/research dishonesty, including but not limited to falsifying data or academic credentials, are also [referred](#) to the West Virginia University [Office of Student Conduct](#) and/or the Office of Academic Integrity (<http://oric.research.wvu.edu/academic-integrity>).

4. GP-CAPS Review

- GP-CAPS meets at the end of each semester to review the academic and professional performance of first year-undifferentiated students, M.S. Students [in Biomedical sciences and Health Sciences](#), and others brought the attention of the committee by a graduate program. Special meetings can be called to handle significant problems that occur outside of this meeting time.
 - In the case of reports originating from graduate programs, GP-CAPS may request to meet with the student prior to rendering their decision. If the student is asked to appear before the GP-CAPS, s/he may be accompanied by a peer or faculty member of his/her choosing that is affiliated with the Health Sciences Center. This individual may confer with the student, but may neither speak for the student nor participate in the proceedings directly, unless requested to do so by the GP-CAPS.
 - The Assistant VP for Graduate Education and the graduate program director participate in the GP-CAPS meeting, but are *ex-officio*, non-voting members.
- GP-CAPS may:
- concur with the graduate program's findings and actions/recommendations
 - impose different actions or penalties based on the same findings or on additional findings
 - [determine](#) if a [student](#) recommended for dismissal from a graduate program can [switch to](#) a different program, and establish conditions associated with this change, if any.
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- For M.S. students and students in the first year of the biomedical Ph.D. program, [progress reviews](#) as well as all recommendations will originate with GP-CAPS. [For these students](#), GP-CAPS may:
 - determine that the student has met standard and advances to the next semester of the curriculum
 - impose remediation, probation, suspension, or dismissal based on their findings
 - The GP-CAPS chairperson reports the Committee's findings and decisions, in writing, to the student, the program director and [in the case of recommendations for dismissal](#), the Vice Dean for Education and Academic Affairs (dean designee for School of Medicine) or, for students in the Pharmaceutical &

Pharmacological Sciences pathway, the Dean of Pharmacy. The Vice Dean for Education and Academic Affairs (dean designee for School of Medicine) adjudicates all matters pertaining to M.D./Ph.D. students, regardless of the graduate program.

Appeals Policy

General Information

- [Students](#) may appeal any academic penalty or sanction imposed by an instructor, the institution or its constituent academic units, as prescribed in the *“Academic Rights, Penalties and Appeal Procedures”* section of the WVU Graduate Catalog.
- The school or college dean (or his/her designee) is the final level of appeal for final grade penalties or exclusion from class. The Associate Vice President for Academic Affairs at the Health Sciences Center is the final level of appeal for academic probation or suspension from a program or school. The Office of the Provost is the final level of appeal for dismissal from the program or university.
- When a penalty is imposed for academic dishonesty, the University’s Academic Dishonesty procedure is followed, as prescribed under WVU Board of Governors Policy 31, concurrent with Policy 15.

Changing mentors

Occasionally students need to change mentors in the course of completing their dissertation research. The protocol to be followed varies depending on the reason:

1. *Mentor has left the University and you are remaining at WVU.* In this situation, you should immediately meet with your graduate program director and set up a plan based on whether or not you will continue on the same project and/or if the mentor will remain involved after he or she leaves. Regardless, you should expect to have another faculty member as an on-site advisor and you should expect to be moved into the laboratory of the on-site advisor or another faculty member conducting similar research.

2. *You are not getting along with your mentor.* Unhappiness in your chosen laboratory and/or with your mentor does not mean that you will definitely need to leave the laboratory. The key to handling these situations effectively is to act as soon as you sense a problem.

First, discuss with your mentor what is troubling you. The mentor may not realize that you were having trouble and may be willing to work with you on a solution. Consider if you were expecting the mentor to fill too many roles and that additional mentors may be helpful for concerns that are less “research-based”.

Second, if talking with your mentor or spreading mentoring roles does not work, immediately involve another faculty member. Ideally, this should be the graduate program director, a member of your committee, the department chair most associated with your program or the Assistant Vice President for Graduate Education (note: this individual is always willing to help but may require that you ultimately go through channels with your program director).

Third, if remaining in the mentor’s laboratory is no longer an option, you need to work with the graduate program director and the Assistant Vice President for Graduate Education, to identify candidate mentors.

Fourth, candidate mentors will need to be interviewed as to their willingness to accept a new student and a trial period is established to determine if the laboratory is a good fit. The trial period is generally at least 2 weeks but should not extend beyond a month.

Fifth, once a new mentor is found, you need to re-do your committee approval form. This will both indicate the new mentor and ensure that the committee is appropriate for the new project. If you will be deleting committee members, please inform them in writing that they will no longer be on your committee and thank them for their service or willingness to serve. If the timing is such that you may be delayed in completing the candidacy exam, you need to petition the Graduate Program Director and the Assistant Vice President for Graduate Education for an extension and a firm date will be determined at which time the exam will be taken.

Finally, you must refrain from any negative comments about the previous mentors. Mentor/mentee relationships fail. Fortunately, this is not often but in each case, it reflects

mutual problems that could not be overcome. No one person is at fault and thus no blame should be assigned. Maintaining a professional approach will result in a smooth transition.

Guidelines for preparation of theses

Neither the University Graduate Catalog nor the Office of Research and Graduate Education provide strict dictates for the structure of theses. The following is a suggested style and some details for preparing for final submission to the Electronic Thesis and Dissertation database (ETD).

Style 1: (more common for theses)

Literature Review
Materials and Methods
Results
Discussion
Conclusion
References

Style 2: (more common for dissertations but can be used if the student has a published manuscript)

Literature Review
Paper 1
Paper 2 (generally not applicable for an MS)
Etc.
Conclusions

Literature Review

The purpose of the literature review is to both demonstrate that the student has read a breadth of literature relevant to the dissertation topic and to introduce the topic, the pertinent background, and most importantly to present the gaps in our current knowledge that lead to the hypothesis that was tested as part of the thesis or dissertation research. There are no strong guidelines for length of the literature review and the student should discuss expectations with both his/her advisor and advisory committee.

The literature review should not just catalog facts and previous studies but rather should be an in depth critique of these. Avoiding referring to specific authors in the sentence structure is the best way to keep the writing focused on the knowledge to be presented rather than just listing relevant studies. Likewise, in writing the literature review, the student should already have read the relevant literature and should write from their knowledge base and then go back and reference the material appropriately. This technique also helps to guard against inadvertent plagiarism of material from individual papers and reports.

Figures in this section should be to illustrate general concepts. Use of figures from specific papers representing data from that paper should be avoided. A cartoon or figure illustrating the hypothesis to be tested or the model for the work to follow can be very useful to add clarity to the document.

References for this section should reflect the original report for that piece of knowledge and not be a secondary review. If style 2 is being used, the references for this section should appear at the end of this chapter as opposed to at the end of the final document.

Materials and Methods

If using style 1, the second chapter is the experimental details for the subsequent sections. This should be written in sufficient detail to allow a reader to repeat the experiments. In general, this section should be in more detail than one would find in a publication so it can be a resource for subsequent researchers to repeat or extend the findings in the thesis or dissertation. If style 2 is used, materials and methods are included in each separate chapter. If more detail is required on a specific technique, this can be added to an appendix.

Results and Discussion

In style 1, the presentation of the results and subsequent discussion would follow the format of a manuscript. Figures and tables appear close to where they are cited in the document. All figures and tables should have legends.

Papers as chapters

When the work of the thesis or dissertation has been published or is being prepared for submission, it is allowable to simply insert the completed or published paper as a separate chapter. It need not be rewritten. If there are multiple authors, the student should indicate what his/her contribution was to the paper. In general, the student should be a first author on these papers or have contributed significantly to the development of the hypothesis and the execution of the experiments. Papers in which the student has contributed only a single figure, should be avoided.

Conclusion

This section provides a final summary of the work and is particularly important when style 2 is used. This section need not be long but should integrate the various chapters and provide future directions for the work.

References

The style for citations is up to the program, discipline, and/or advisor. In general, a style that includes all authors and titles of the papers is most useful for later reference.

Acknowledgements (optional)

A section at the beginning of the document to acknowledge the help of others in completing the work is a nice tradition but not required. This section can be personal but should remain professional.

Appendix (optional)

Some advisors like the student to summarize unpublished or orphan results in the appendix. This is optional and is generally for the convenience of the laboratory as well as documenting the work done by the student.

Special notes for depositing with ETD

1. If the student is reprinting papers that are already published, he/she needs to get permission from the journal to do so. Some journals have explicit statements to this effect on the website near the Guide to Authors. For other journals, this will require a letter to the editor of the journal. Permission to reprint is nearly always provided but may take some time to receive. Do not wait until the last minute to secure this information. Evidence of permission can be included in an appendix.
2. Follow the directions on the ETD site precisely. The formatting for the title pages is very specific and the inclusion of the student's CV is required.
3. Copyright. The ETD directions provide information on copyrighting the document. The following is designed to add some clarity to these directions. In general, any unique writing is protected by common law copyright of that work. Publications included in the work are already copyrighted and the copyright is owned by the journal. For most students, this will be sufficient protection. If some of the work is unpublished and will not be published, the student may in consultation with his/her advisor choose to secure additional copyright protection and will need to pay the associated fee for this copyright. If the work is a chapter that will be submitted in the near future, the student may choose to embargo the thesis or dissertation until the work can be published or a patent obtained. An embargo delays the release of the dissertation for view by others for a selected period of time.

How to set up a Thesis (MS) Advisory Committee:

1. Minimum of 3 members; if the student is changing from the PhD to the MS degree, the committee can remain the same or one or two members can be dropped.
2. The majority must be have full graduate faculty membership – the list can be found here for HSC faculty:

<http://www.hsc.wvu.edu/resoff/graduate-education/faculty-resources/graduate-faculty-status/>

and here for all WVU faculty (although this list is not yet complete):

<http://graduate.wvu.edu/faculty-staff/graduate-faculty-information/list-of-members>

3. The graduate faculty status that a faculty member has in his/her home department is honored for committee service throughout the University (i.e., the faculty member does not need to be reapproved by HSC).
4. One member can be from another University provided he/she is an active scientist.
5. Chair (co-chair) of the committee is your thesis advisor (except NIOSH)
6. All committees must be approved by the program director, dean of the school (or their designee) and the Assistant Vice President for Graduate Education at the HSC. Additions and removals to the committee must be approved by the member being added or deleted, and the program director, dean, and Assistant Vice President for Graduate education.

Special note for students at NIOSH:

- NIOSH investigators cannot have full graduate faculty status because they are not full time WVU employees (adjunct does not count).
- A NIOSH mentor can be the primary advisor/mentor of a student and can be a co-chair of your committee, if allowed by that program (see point 6 above).
- Be careful when adding additional investigators from NIOSH to a committee so that the metrics in point 2 above are still met. Use the ad hoc method to include additional expertise at meetings.