2019-2020 Academic Requirements for PhD Degree
Graduate Program in Interdisciplinary Biomedical Sciences

This document describes the policy and procedures for PhD training in the Graduate Program in Interdisciplinary Biomedical Sciences (GPIBS) at the University of Arkansas for Medical Sciences (UAMS). The policies and procedures specific to the GPIBS Graduate PhD Degree Program are in addition to the general rules and regulations of the UAMS Graduate School and may be supplemented by requirements of the GPIBS tracks.

Students and their advisors should be familiar with the requirements outlined herein, and with those of the Graduate School described in the current edition of the UAMS Catalog and the UAMS Graduate School Student Handbook (both available at the Graduate School website http://gradschool.uams.edu), in addition to the requirements of the relevant GPIBS track.

To fulfill the requirements for the PhD degree students must satisfactorily complete the course work required by the GPIBS and the designated GPIBS track, pass the candidacy examination, and complete the research requirements including the writing of a dissertation and pass the final oral examination (dissertation defense). A student must complete the degree within 7 consecutive calendar years from the date of passing the candidacy examination. Post-baccalaureate PhD students must have a minimum of 72 credit hours, and post-master's PhD students must have a minimum of 42 credit hours.

I. GPIBS Curriculum

The requirements for graduating with a PhD degree include the completion of a minimum of 24 semester credit hours of didactic course work*, including the courses listed below for years 1 and 2. The GPIBS tracks and/or doctoral advisory committees may specify the courses to be taken as electives and may require additional courses. Full Track Curriculum are detailed below in Section X.

Year 1—Fall Semester

Course Name (Course Number)	Credits
● Biochemistry & Molecular Biology (BIOC5101)	3*
● Cell Biology (NBDS5111)	3*
● Gene Expression (PHYO5112)	3*
● Scientific Communication & Ethics 1 (PCOL5117)	1*
● GPIBS Seminar (IBSD5102)	1
● Research (IBSD5101)	1

Year 1—Spring Semester

Specific coursework prescribed varies among tracks with generally track-specific electives taken.

● Scientific Communication & Ethics 2 (PCOL5119)	1*
● GPIBS or Track Specific Seminar	1
● Research	1
● Track specific courses and/or electives	6-9*

Year 1—Summer Term

● Research	1

* = Contributes toward the didactic course work requirement.

Year 2—See track specific curriculum

Notes:

1) The order of specified course work may vary depending upon course offerings available.
2) Students entering the GPIBS Graduate PhD Degree Program with advanced training (such as students who have earned MS degrees, students transferring from other doctoral programs, or MD/PhD students who have completed portions of their MD training) **may** be eligible to have some course requirements transferred.
3) Students in good standing may take elective coursework at any time if agreed upon by the student and major advisor. Students who have not selected a major advisor require the approval of the GPIBS Track Leader.

After Year 2:

Students prepare for and pass the candidacy examination (described below), ideally prior to August 15 of year 2. After attaining candidacy, PhD students will focus the majority of their time and effort on developing, completing and defending a doctoral dissertation. Candidates are required to complete a minimum of 18 semester credit hours of Doctoral Dissertation Research.

All students must enroll in GPIBS or Track specific Seminar each semester until they graduate. Full Track Curriculum are detailed below in Section X.

II. Research Rotations

To learn about current research interests and techniques available on campus and to become acquainted with potential major advisors and research laboratories, GPIBS graduate students working toward their PhD participate in 3 research rotations during their first semester by registering for GPIBS Research (IBSD5101). In collaboration with their first semester GPIBS faculty advisor, students select rotation advisors from any of the active laboratories in participating GPIBS tracks. Students are expected to spend approximately 15 hours/week in the laboratory during rotations, although some flexibility is expected to accommodate coursework, etc. Students who have not found a research home after 3 rotations can continue to rotate in semester 2.

III. Major Advisor and Track Selection

Ideally after the first semester, students will select a track. The following tracks are available:

- Biochemistry and Molecular Biology
- Cell Biology and Physiology
- Microbiology and Immunology
- Neuroscience
- Pathobiology
- Pharmacology, Toxicology and Experimental Therapeutics
- MD/PhD

Along with selecting a GPIBS track, the student will select a major advisor. Any faculty member of the UAMS Graduate Faculty is eligible to serve as a major advisor, as long as that faculty

member is a member of a GPIBS track and has an active research program. The advisor and track selections must be forwarded to the Dean of the Graduate School for approval.

IV. Promotion and Dismissal

GPIBS students must maintain a cumulative UAMS grade point average (GPA) of 2.85 (A = 4.0) or better in order to be promoted in good standing to the subsequent semester. If a student is promoted to the next semester on probation, the student's cumulative GPA must be raised to 2.85, or above, upon completion of the next semester. Failure to raise the cumulative GPA above 2.85 may result in dismissal of the student from the GPIBS. Students on probation that improve their cumulative GPA to 2.85, or better, will be promoted to the next semester in good standing.

At the end of each semester, the GPIBS Advisory Committee will review the academic record of any student who drops a course or earns a grade of C or less in any of the core curriculum courses. The committee will recommend to the GPIBS Director whether the student should be dismissed or be required to retake the course(s). If allowed to continue, students earning a C or less will be required to retake the course and earn a B or better.

By the end of the second year, students must have completed the three GPIBS core courses (Gene Expression, Biochemistry and Molecular Biology, Cell Biology) achieving a B average or better.

A student may be dropped from further study and dismissed from the Graduate School by the Dean of the Graduate School if at any time his/her performance is considered unsatisfactory as determined by the GPIBS Advisory Committee. Academic dishonesty (including cheating, plagiarism and forgery) and/or failure to maintain a specified cumulative grade-point average are considered to be unsatisfactory performance.

V. Stipends

Students in the GPIBS Graduate PhD Degree Program may be eligible for a stipend, depending upon availability and standing. Generally, incoming PhD students are appointed to a graduate research assistantship for a period of up to 24 months. During this period, the Graduate School also pays tuition, but students are responsible for paying their fees. After 24 months, student stipends, tuition, and fees are to be paid by the major advisor or other funding sources.

In order to remain eligible for a stipend students must register each term as a full-time student (minimum of 9 semester credit hours during the fall and spring terms and 1 credit hour during the summer session), and remain a student in good standing.

VI. Doctoral Advisory Committee

After a student selects a major advisor (ideally by the end of the first year), the student and advisor together select a doctoral advisory committee composed of five members (including the major advisor). At least three members of the committee must be members of the relevant GPIBS track. The committee must include members who hold primary appointments in at least two departments at UAMS. Up to 2 members of the committee can be at large (other faculty at

UAMS or another institution). Exceptions to the committee structure may be made by request in writing to the dean. The list of committee members shall be submitted to the Track Leader, and subsequently to the Dean of the Graduate School, for approval.

The major advisor will chair the student's doctoral advisory committee. Beginning in year 2 the student is required to have at least one meeting with the advisory committee to outline their dissertation project that will form the basis for the research/dissertation proposal that s/he will work on during Scientific Communication and Ethics III/IV as well as the guidelines followed for the candidacy exam (described below).

Following admission into candidacy (after passing the candidacy exam) for the PhD degree, the student is required to meet with the doctoral advisory committee at least twice annually, in the fall and the spring or summer terms, to keep the committee apprised of research progress. A Student Advisory Committee Report (http://gradschool.uams.edu/files/2015/12/Graduate-Student-Advisory-Committee-Meeting-Form-2015.pdf) must be completed and filed with the Graduate School for each semi-annual committee meeting. The biannual meeting requirement is designed to assure adequate student progress and to keep open lines of communication between the student and the committee. Following each meeting, it is the student's responsibility to file the Committee Report with the Graduate School and to provide the Track Leader with a copy. Failure to meet with the doctoral advisory committee at least annually will result in a review of student progress and status in the program by the GPIBS Advisory Committee.

The doctoral advisory committee and student may also be convened at the request of a simple majority of the committee members.

VII. Candidacy Examination

The doctoral advisory committee will administer the candidacy examination at the end of year 2, ideally it will be completed prior to August 15. It is anticipated that the student will have successfully completed most required coursework prior to the candidacy examination.
The candidacy examination will consist of an oral defense of an original Research/Dissertation Proposal. This proposal will be written by the student (with mentor guidance) during SCE III/IV in the general area of the student's research interests. The student will submit the Research/Dissertation Proposal to the advisory committee for review (at least 2 weeks prior to the scheduled oral exam) during which the committee members may make suggestions for improvement. The proposal should follow the guidelines of an NIH F application, with an Abstract (30 lines), Specific Aims (1 page), Research Strategy (6 page maximum), Bibliography, Respective Contributions, and Vertebrate Animals/Human Subjects (if applicable). Though not formally graded, once at least 4 members of the committee determine the Research Proposal acceptable, the candidacy examination will proceed to the oral defense. All students (if eligible) are encouraged to submit their proposals for funding by the NIH, NSF or to similar training programs sponsored by other government agencies, scientific societies, or private foundations.

The Track Leader (or designee) will attend the oral defense component as a non-voting member and will serve as a moderator. In the oral examination the student will present the proposal as a short seminar and then defend it by answering questions and concerns raised by committee members. Related material presented in the student's course work will usually be included in the oral portion of the examination. The candidacy examination will be evaluated by the

student's doctoral advisory committee and shall result in a grade of PASS or FAIL (a passing grade requires a passing vote of at least 80% of the committee members). A student who has passed the candidacy examination will, with the approval of the Dean of the Graduate School, be admitted into candidacy for the PhD degree and recognized in the Research Induction Ceremony.

If the student fails to pass the oral defense, s/he will be given an opportunity to retake the oral exam within 4 weeks or at the discretion of the Doctoral Advisory Committee. Any student who fails to pass either the oral portion of the candidacy examination after two attempts will be recommended for dismissal from the program. The student will be notified of any decisions in writing by the Dean.

VIII. Dissertation and Defense

The student's doctoral advisory committee shall be responsible for the approval of the written dissertation and the final oral examination (dissertation defense). After the written dissertation is completed and forwarded to all members of the advisory committee the committee shall be allowed at least two weeks to evaluate it. After the committee has given their approval the major advisor will schedule the dissertation defense. Not less than 30 days prior to the date of the dissertation defense, public notices must be posted on campus announcing the title of the dissertation, and the date, time and location of the presentation. The final examination will be evaluated by the student's dissertation advisory committee and shall result in a grade of PASS or FAIL (a passing grade requires a passing vote of at least 80% of the committee members). The student shall be notified of the outcome immediately after the final examination.

Upon passing the final oral examination, it is the responsibility of the student to prepare and submit final copies of the dissertation to the dissertation advisory committee and to the appropriate personnel in the UAMS Library for approval. According to the Graduate School regulations, the final copies (meeting the standards of the Library for dissertations) must be submitted to the UAMS Library at least 10 days before the degree is to be conferred.

IX. Appeals

A student has the right to appeal any decision made by the faculty. If a student feels a faculty decision is inappropriate, the student may appeal the decision to the Track Leader. A student who wishes to further appeal the decision of the Track Leader shall follow the Grievance Procedures outlined in the Graduate Student Handbook.

X. Track Curriculum

Biochemistry and Molecular Biology Track

Year 1 Fall (12 credit hours)

- GPIBS Core described in Section I

Year 1 Spring (10 credit hours)

- 1 credit hour Seminar (BIOC 5105)
- 1 credit hour Scientific Communication and Ethics II (PCOL 5119)
- 3 credit hours Biochemical Methods (BIOC 5109)
- 3 credit hours Biological Chemistry (BIOC 5106)
- 2 credit hours Elective and/or Research

Each summer until graduation

- 1 credit hour Research

Year 2 Fall (10 credit hours)

- 1 credit hour Seminar (BIOC 5105)
- 1 credit hour Scientific Communication and Ethics III (PCOL 5120)
- 3 credit hours Biostatistics I (BIOS5013)
- 2 credit hours Special Topics in Biochemistry-Proteomics/Proteins**
- 2 credit hours Special Topics in Biochemistry-Enzymes/Cancer Biology**
- 2 credit hours Research

**May take Elective or Research and take Spec Topics in Year 2 Spring

Year 2 Spring (10 credit hours)

- 1 credit hour Seminar (BIOC 5105)
- 1 credit hour Scientific Communication and Ethics IV (PCOL 5121)
- 8 credit hours Elective and/or Research

Above includes 22 credit hours of the 24 required coursework. Electives must include 2 additional course credit hours based on advice from the student's mentor and/or advisory committee.

Year 2 Summer

Candidacy Exam (research proposal submitted to committee followed by oral defense)

Years 3- Degree Completion

- 1 credit hour Seminar each semester (BIOC 5105) excluding summer
- 9 credit hours of Dissertation Research (until reach 18) and/or Research

Cell Biology and Physiology Track:

Year 1 Fall (12 credit hours)

- GPIBS Core described in Section I.

Year 1 Spring (10 credit hours)

- 1 credit hour Seminar (PHYO 5106)
- 1 credit hour Scientific Communication and Ethics II (PCOL 5119)
- 3 credit hours General Physiology (PHYO 5103)
- 3 credit hours Biostatistics I (BIOS 5013)-may take other selective and take Biostats in fall year 2
- 2 credit hours Elective and/or Research

Each summer until graduation
- 1 credit hour Research

Year 2 Fall (10 credit hours)
- 1 credit hour Seminar (PHYO 5106)
- 1 credit hour Scientific Communication and Ethics III (PCOL 5120)
- 3 credit hours Molecular Cell Biology (MBIM 6103)
- 5 credit hours Elective and/or Research

Year 2 Spring (10 credit hours)
- 1 credit hour Seminar (PHYO 5106)
- 1 credit hour Scientific Communications and Ethics IV (PCOL 5121)
- 8 credit hours Elective and/or Research

A minimum of 24 credit hours of coursework are required. Electives are chosen based on advice from the student's mentor and/or advisory committee.

Year 2 Summer
Candidacy Exam (research proposal submitted to committee followed by oral defense)

Years 3- Degree Completion
- 1 credit hour Seminar (PHYO 5106) each semester excluding summer
- 9 credit hours of Dissertation Research (until reach 18) and/or Research

Microbiology and Immunology Track:
Year 1 Fall (12 credit hours)
- GPIBS Core described in Section I.

Year 1 Spring (10 credit hours)
- 1 credit hour Seminar (MBIM 5106)
- 1 credit hour Scientific Communication and Ethics II (PCOL 5119)
- 3 credit hours Basic Principles of Microbiology (MBIM 5103)
- 3 credit hours Immunology (MBIM 5101)
- 1 credit hour Current Topics in Microbiology (MBIM 5109) or Immunology (MBIM 5110)
- 1 credit hour Research

Each summer until graduation
- 1 credit hour Research

Year 2 Fall (11 credit hours)

- 1 credit hour Seminar (MBIM 5106)
- 1 credit hour Scientific Communication and Ethics III (PCOL 5120)
- 1 credit hour Current Topics in Microbiology (MBIM 5109) or Immunology (MBIM 5110)
- 4 credit hours Advances in Microbiology and Immunology I (MBIM 6104)
- 3 credit hours Biostatistics I (BIOS 5013)
- 1 credit hour research

Year 2 Spring (10 credit hours)
- 1 credit hour Seminar (MBIM 5106)
- 1 credit hour Scientific Communications and Ethics IV (PCOL 5121)
- 1 credit hour Current Topics in Microbiology (MBIM 5109) or Immunology (MBIM 5110)
- 4 credit hours Advances in Microbiology and Immunology II (MBIM 6105)
- 3 credit hours Research

Year 2 Summer
Candidacy Exam (research proposal submitted to committee followed by oral defense)

Years 3- Degree Completion
- 1 credit hour Seminar (MBIM 5106) each semester excluding summer
- 8 credit hours of Dissertation Research (until reach 18) and/or Research
- 1 credit hour Current Topics in Microbiology (MBIM 5109) or Immunology (MBIM 5110) each semester excluding summer

Neuroscience Track:
Year 1 Fall (12 credit hours)
- GPIBS Core described in Section I.

Year 1 Spring (12 credit hours)
- 1 credit hour Seminar (NBDS 5116)
- 1 credit hour Scientific Communication and Ethics II (PCOL 5119)
- 1 credit hour research
- 3 credit hours Biostatistics I
- 3 credit hours Basic Neuroscience (NBDS 5106)
- 3 credit hours Cellular and Developmental Neuroscience (NBDS 5114)

Above included 18 credit hours of the 24 hours of required didactic coursework. Electives (6 hours minimum) are chosen based on advice from the student's advisor and/or advisory committee.

Each summer until graduation
- 1 credit hour Research

Year 2 Fall (10 credit hours)
- 1 credit hour Seminar (NBDS 5116)
- 1 credit hour Scientific Communication and Ethics III (PCOL 5120)
- 8 credit hours Electives and/or Research

Year 2 Spring (10 credit hours)

- 1 credit hour Seminar (NBDS 5116)
- 1 credit hour Scientific Communications and Ethics IV (PCOL 5121)
- 8 credit hours NBDS Electives, and/or Research

Year 2 Summer

Candidacy Exam (research proposal submitted to committee followed by oral defense)

Years 3- Degree Completion

- 1 credit hour Seminar (NBDS 5116) each semester excluding summer
- 9 credit hours of Dissertation Research (until reach 18) and/or Research

Pathobiology Track:

Year 1 Fall (12 credit hours)

- GPIBS Core described in Section I

Year 1 Spring (12 credit hours)

- 1 credit hour GPIBS Seminar (IBSD 5102)
- 1 credit hour Scientific Communication and Ethics II (PCOL 5119)
- 3 credit hours General Physiology (PHYO 5103)
- 3 credit hours Histology and Investigative Pathology (PATH 5150)
- 3 credit hours Biostatistics (BIOS 5013) or equivalent
- 1 credit hour Research

Each summer until graduation

- 1 credit hour Research

Year 2 Fall (10 -12 credit hours)

- 1 credit hour GPIBS Seminar (IBSD 5102)
- 1 credit hour Scientific Communication and Ethics III (PCOL 5120)
- 3 credit hours Pathologic Basis of Disease (PATH 5101)
- 3-6 credit hours Electives*
- 2-4 credit hours Research

Year 2 Spring (10-11 credit hours)

- 1 credit hour GPIBS Seminar (IBSD 5102) each semester excluding summer
- 1 credit hour Scientific Communications and Ethics IV (PCOL 5121)
- 3-6 credit hours Electives*
- 5-6 credit hours Research

*Electives are chosen at the discretion of the mentor and the student's advisory committee. Possible courses include but are not limited to:
Biology of Cancer (BIOC 6103), Basic Biology of Aging (PHYO 6102), Immunology (MBIM 5101), Molecular Epidemiology (EPID 5335), Cellular Endocrinology (PHYO 5104), Human Development (NBDS 5124), Molecular Cell Biology (MBIM 6103), Systems Therapeutics (PCOL 6101), Introduction

to Oncology (INTX 5082-old number), Cancer Epidemiology (EPID 5332), Epi of Chronic Diseases (EPID 5326), and Basic Neuroscience (NBDS 5106)

Year 2 Summer
Candidacy Exam (research proposal submitted to committee followed by oral defense)

Years 3- Degree Completion
- 1 credit hour Seminar (IBSD 5102) each semester excluding summer
- 9 credit hours of Dissertation Research (until reach 18) and/or Research

Pharmacology, Toxicology and Experimental Therapeutics
Year 1 Fall (12 credit hours)
- GPIBS Core described in Section I

Year 1 Spring (10 credit hours)
- 1 credit hour Seminar (PCOL 5109)
- 1 credit hour Scientific Communication and Ethics II (PCOL 5119)
- 3 credit hours Principles and Methods of Pharmacology and Toxicology (PCOL 5105)
- 3 credit hours General Physiology (PHYO 5103)
- 1 credit hour Journal Club (PCOL 5115)
- 1 credit hour Research

Each summer until graduation
- 1 credit hour Research

Year 2 Fall (10 credit hours)
- 1 credit hour Seminar (PCOL 5109)
- 3 credit hours Graduate Pharmacology and Therapeutics (PCOL 5107)
- 1 credit hour Scientific Communication and Ethics III (PCOL 5120)
- 3 credit hours Elective (choose to take in Fall or Spring of 2nd year)*
- 1 credit hour Journal Club (PCOL 5115)
- 1 or 4 credit hours Research (based on taking elective or not)

Year 2 Spring (10 credit hours)
- 1 credit hour Seminar (PCOL 5109)
- 1 credit hour Scientific Communications and Ethics IV (PCOL 5121)
- 3 credit hours Elective (choose to take in Fall or Spring of 2nd year)*
- 3 credit hours Experimental Design and Statistics
- 1 credit hour Journal Club (PCOL 5115)
- 1 or 4 credit hours Research (based on taking elective or not)

*The elective must include 3 additional course credit hours based on advice from the student's mentor and/or advisory committee. Clinical Toxicology (INTX 6102) or Systems Therapeutics (PCOL 62101) are highly encouraged.

Year 2 Summer

Candidacy Exam (research proposal submitted to committee followed by oral defense)

Years 3- Degree Completion

- 1 credit hour Seminar (PCOL 5109) each semester excluding summer
- 9 credit hours of Dissertation Research (until reach 18) and/or Research