Jacobs School of Medicine and Biomedical Sciences
University at Buffalo

GUIDELINES FOR Ph.D.
GRADUATE PROGRAM IN BIOCHEMISTRY
AY 2025-2026

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I. Preamble

These Guidelines provide graduate students, faculty, the Graduate Affairs Committee and the Director of Graduate Studies with a description of the program and policies for graduate study in the Department of Biochemistry. These departmentail Guidelines are nested within those put forth by the Faculty Council Policy on Graduate Education, located here: https://medicine.buffalo.edu/faculty-council/policies/faculty-council-policy-graduate-education.html.

II. Diversity Statement

The Department values the diversity of all individuals regardless of race, ethnicity, sex, disability, religion, gender identification or sexual orientation. Diversity leads to excellence. We strive to create and foster an inclusive environment that is safe and gives voice to all members of the department: students, trainees, staff and faculty.

III. The Graduate Affairs Committee (GAC)

A Graduate Affairs Committee (GAC), chaired by the Director of Graduate Studies and consisting of three other faculty members will be responsible for administering all facets of the graduate program, except admissions. The Director of Graduate Studies and the other members of the Committee are appointed by the Department Chairperson.

IV. Program Learning Outcomes

- Graduating students will demonstrate a broad base of established and evolving knowledge within a chosen discipline and detailed knowledge of a specific research area in their field of study.
- Enrolled students will plan and conduct research on a specific project under the guidance of an advisor while developing the intellectual independence that typifies true scholarship.
- Graduating students will demonstrate skills and proficiency in oral and written communication sufficient to present their thesis work to scientific and lay audiences and to navigate grant application and scientific publishing processes.
- Graduating students will be trained in responsible conduct of research to improve their ability to make ethical and legal choices. This includes practicing rigor, honesty, and integrity in experimental design and data analysis, reporting data with acceptable standards of reproducibility and understanding the rules for ownership and access to data and the criteria for authorship.

V. Admission Requirements

A Bachelor of Arts or Science is required. A background in biologic and/or chemical science, with some physical chemistry and mathematics, including calculus, is typically required for admission. Doctoral candidates are admitted primarily through the Ph.D. Program in Biomedical Sciences (PPBS).

VI. Training Program for the Ph.D. Degree

The graduate program in Biochemistry is based on the premise that the most effective curriculum is one in which emphasizes self-study, in-depth discussions and problem solving.

The first-year curriculum follows the PPBS guidelines and requirements. This includes courses in Research Ethics and Fundamentals of Biomedical Research I and II. 4-6 credit hours of electives and Critiquing Scientific Literature are also required in the spring semester. Students undertake at least 4 lab rotations that foster proficiency in areas that are beyond formal courses and allow selection of a laboratory/home for thesis work. The training program provides a variety of research-related experiences for the graduate student which includes a departmental seminar program of visiting scientists and a Graduate Student Seminar. The Graduate Student Seminar provides the student opportunity and experience in formal oral presentations of their thesis work and to get feedback from the faculty, staff and students of the department, committee members and other attendees. All students are required to attend departmental seminars regularly throughout their training.

During their fourth semester, students will develop an original research proposal, which they will defend before their dissertation committee. Preparing an original research proposal provides an opportunity to apply and sharpen a combination of the skills acquired throughout the first year of the program. This program is designed to prepare students for their Ph.D. research work and for the continual learning process of a career in science. The largest part of developing into a productive research scientist occurs during the research for the dissertation.

VII. Student Classification

A. Matriculating Students

Matriculating students pursue a course of study that will lead to a Ph.D. degree. Students are most commonly admitted through the PPBS Admissions Committee. The Ph.D. requires a minimum of 72 credit hours.

B. Non-matriculating Students

This status is reserved for students who are not seeking a degree at this university but wish to take biochemistry courses. Non-matriculated students must submit an online application via SLATE for non-degree program admission. Such individuals should provide evidence of meeting course prerequisites. The non-matriculating student status is granted for a one-year period, but may be renewed. A non-matriculating student who wants to enter a degree program, must have a complete application for matriculation considered by the GAC. Transfer of credits obtained during non-matriculating status to a matriculating degree program is not automatic, but may be granted upon review by the GAC.

VIII. Mentor and Committee Members

During the first two semesters, students are normally advised on academic matters by the Director of the PPBS. Students are also encouraged to consult with other faculty. At the end of their second semester, students will choose their dissertation research advisor or mentor. Students are expected to start working in their mentor's laboratory in the summer following their first year.

Selection of Dissertation Mentors

Selection of the Mentor is one of the most important decisions a student will make. The decision should be a careful and deliberate one. A student must choose a lab in which they feel comfortable with the mentor and other lab personnel and where they find the proposed project to be exciting and worthy of study. Students should complete more than one rotation prior to determining which laboratory they are interested in for thesis research. Final selection of mentors for PPBS students will require agreement of both the student and the proposed mentor and will follow procedures established by the PPBS program. For non-PPBS students, an agreement between the student and faculty mentor and Departmental Chair approval will be required.

The Dissertation Committee is chaired by the mentor and consists of a minimum of four graduate faculty (including the mentor), two of whom must have a primary appointment in the Department of Biochemistry. The mentor must have a primary or secondary appointment in the department. In addition, a fourth committee member must have his/her primary appointment outside of the Department of Biochemistry, and must hold an appointment equivalent to a tenure-track Assistant Professor or higher at the University at Buffalo or Roswell Park. A non-tenure track faculty member may serve as the outside committee member if they are a member of the graduate faculty. Additional Biochemistry graduate faculty members may be appointed upon agreement between the student and his/her mentor, usually with the goal of bringing some special expertise into the committee. The Biochemistry Department Chair is an ex officio member of all committees, including Dissertation Committees. In the student's fifth semester in the Doctoral Program in Biochemistry, the student will register for 1 hour of BCH 703, Research Progress Presentation. In these meetings, the student will report to the Dissertation Committee on the progress of her/his research, and outline plans for the next year. Registration in subsequent years is required and students are expected to meet with the Committee at least once per year. Students are required to submit Thesis Committee Report forms following each meeting.

VIX. Course Requirements for the Ph.D. Degree

The Ph.D. degree requires a minimum of 72 credit hours that include both academic course work as well as thesis research. The first year required courses follow the PPBS first year curriculum. Once matriculated into the Biochemistry doctoral program students must take two Biochemistry elective courses as listed below. Additional courses are: BCH 504, Doctoral Student Seminar (taken in years 2 –5); and BCH 565, Research Proposal (taken in the 4th semester). A total of 6 credits of electives in a minimum of two courses are to be chosen by the student **in consultation with the mentor**. The electives must be 500-600 level courses in science, math, or computer science. The remaining credits will be research credits.

X. The Curriculum for the Ph.D. Degree

PPBS FIRST YEAR CURRICULUM - FIRST SEMESTER

Course Number	Title	Credits
BMS 514	Research Ethics	2
BMS515	Fundamentals of Biomedical Research	4
BMS516	Fundamentals of Biomedical Research	3
BMS 509	Ph.D. Program Laboratory Rotation	3-5
BMS 510	Ph.D. Program Laboratory Rotation	3-5
	TOTAL HOURS	15

BMS FIRST YEAR CURRICULUM - SECOND SEMESTER

BMS 509	Ph.D. Program Laboratory Rotation	3-5
BMS 510	Ph.D. Program Laboratory Rotation	3-5
BMS 511	Critiquing Scientific Literature	1

4-6 credits hours of Electives - see PPBS curriculum for current selections

CURRICULUM BEYOND THE FIRST YEAR

BIOCHEMISTRY ELECTIVE COURSES:

2 Courses Required	(requirement may be fulfilled in second semester above):	
BCH 507	Protein Structure Function	2-3
BCH 508	Biochemistry of Gene Expression	2
BCH 512	Developmental Genomics & Stem Cell Biology	3
BCH 519	Introduction to Bioinformatics & Computational Biology	3
BCH 603	Cellular Signaling in Health & Disease	2
BCH 607	DNA Replication & Repair	2
BCH 611	Advanced Microbial Genetics	2
STB 531	Protein Prod & Molec Analysis	3

BCH 504	Graduate Student Seminar Semester of registration up to 5 semesters/credits	1	Every Spring

MIC 610	**Critical Analyis -Fall,1st semester in BCH**	**1**
BCH 565	**Research Proposal-Spring Semester, 1st year Matriculated into program**	**2**
BCH 701	**Thesis Research – FALL**	**1-12**
BCH 702	**Thesis Research - SPRING**	**1-12**
BCH 703	**Research In Progress Presentation-FALL**	**1**
500/600 Level	**Special Topics/Electives**	**6**

XI. Responsible Conduct of Research (RCR) Training Requirement

All students admitted to a PhD program are required to document successful completion of "Responsible Conduct of Research" (RCR) training when they submit their PhD Appication to Candidacy Form for their PhD degree. This training requirement may be fulfilled by either (1.) enrolling in and passing with a grade of B (3.00) or better in LAI 648 *Research Ethics* or RPG 504 *Responsible Conduct of Research* or BMS 514 *Intro to Scientific Investigation and Responsible Conduct* or RSC 602 *Research Ethics for the Health Science*s or (2.) completing a Collaborative Institutional Training Initiative (CITI) online program in Responsible Conduct of Reseach (RCR) course with an average score of 80 percent or higher, or (3.) successfully completing UB's Responsible Research Micro-Credential. Students opting to complete the CITI online course, or the Responsible Research Micro-Credential must supply proof of completion with their PhD Application to Candidacy.

The University at Buffalo has an institutional membership in the CITI online RCR program. That online program can be accessed through the CITI Program website.

There are four versions of the basic CITI online RCR course from which students should choose the version most appropriate for their area of doctoral study: biomedical sciences, social and behavioral sciences, physical sciences or humanities. The RCR program is comprised of a series of modules, each of which consists of readings and case studies and ends with a quiz covering the material. The program allows the student to enter and exit at any point and to re-take the quiz associated with each section. A minimum total score of 80 percent is required to pass the online course. Assistance is available online at the CITI website if any technical difficulties are encountered.

Once the student has successfully completed the appropriate version of the CITI RCR program, they must print the "Completion Report" from within the CITI program and submit it with the PhD degree Application to Candidacy.

XII. Description of Course Work

Public Presentation of Research

Part of doctoral student training and experience is oral presentation of primary research in a public format. Presentation skills are critical to success in science and our effort to provide assistance in acquiring those skills has three components as described below. Note: "First year" refers to students in their first year in the Doctoral Program in Biochemistry, which will be their second year in the PhD within the Graduate School or their third year in the Medical Scientist Training Program (MSTP).

Course Registration and Course Credit Requirements

BCH504 –Graduate Student Seminar (1 credit course/each Spring semester). Students are required to register for BCH504 in all spring semesters registered in the Doctoral Program in Biochemistry up to a maximum of 5 credit hours (5 semesters).

Requirements: Student attendance at BCH504 and BCH565 presentations is required. Active participation in the form of comments and questions is an essential aspect of this and all Department-sponsored presentations (Doctoral Student, Departmental, and Distinguished Scientist Seminars) and is strongly encouraged. Third/fourth year students may be assigned by the GAC to one Doctoral Student Seminar per semester to serve as host and moderator to encourage active participation by their fellow students.

Students will be given an S grade based on presentation (presenting students) and attendance (all students)

BCH565 – Research Proposal (2 credit course/Spring semester). Students register for BCH565 in the Spring Semester of their first year in the Doctoral Program in Biochemistry (their second year in PhD program). Requirements for BCH565 are described in detail in the **Research Proposal Section**.

Programmatic Components of Training in Oral Presentation

I. Graduate Student Seminar:

1) **First Year Students**. Students in their first year in the Department as Doctoral students prepare the Research Proposal that is the Department's Preliminary Examination for Application to Candidacy for the Ph.D. degree (see Research Proposal below). First year students register for BCH565 in the Spring Semester to receive credit for both the presentation and a successful defense of the Proposal. As doctoral students in Biochemistry, these students also register for and participate in the Graduate Student Seminar, BCH504.

2) **Second Year Students**. Students in their second year in the Department as Doctoral students are required to do a ~ 25-minute presentation to the Department in the form of a junior research in progress talk.

3) **Third/Fourth Years.** Students will be required to do a minimum of one additional public research presentation (~50 minutes) in BCH504 on their thesis research. Students may choose to give a fourth Doctoral Research Seminar presentation, if they so desire.

II. Biochemistry Department Research Day:

The Biochemistry Research Day typically takes place annually near the end of the Spring Semester. All students are required to attend and present as listed below.

- First Year: Students in their first year in the Department are expected to present a Poster at the Research Day.
- Second/Third Years: Students in their second and third years in the Department are expected to make an oral presentation.

Fourth Year and beyond: Students who anticipate defending their thesis in that calendar year are not required to make a presentation. Students who are not close to defending will continue to present an oral presentation of their research.

III. BCH401 – Presentation of Research to Undergraduate Biochemistry Majors:

Senior graduate students are offered the opportunity to present an overview of research techniques to the Undergraduate Majors in Biochemistry (BCH401). This is a one-hour lecture/discussion designed to introduce our undergraduate Biochemistry majors to common and/or important research techniques used within biochemical and biomedical research fields. This oral presentation provides a chance for senior Doctoral students to gain experience in a more formal class/teaching setting. This activity is not a requirement for degree conferral; the choice to participate in BCH401 is made by the student in consultation with the Thesis Mentor.

Graduate Student Seminar - BCH 504

The objective of the Graduate Student Seminar is to provide a mechanism for Doctoral Students gain experience and expertise in preparing and presenting a Research/Teaching Seminar. There are three vehicles for doing so: 1) the Research Proposal Presentation (BCH565); 2) junior research in progress presentation and 3) Thesis Research-In-Progress seminar. The first of these is described in BCH565. The last of these is to follow the format of a research seminar: Introduction and Background, Research Plan and Experimental Design; Results and Discussion; Summary and Conclusions. The presence of all Thesis Committee members is highly recommended for second through fourth-year students – it is the responsibility of the student presenter to notify their committee members ahead of time to avoid any schedule conflict.

Special Topics and Electives

These are advanced courses in the 500 and 600 level in specialized areas of biochemistry. The format of each depends on the subject and the instructor. Up-to-date descriptions can be obtained from the Director of Graduate Studies. Special Topics and Electives may be taken at any time but a minimum of 2 courses and 6 credit hours are required before a student may graduate. The electives may be selected from courses taught outside of the department, subject to the approval of the mentor and committee members if the mentor deems necessary. The Special Topics requirement can be fulfilled by achieving a grade of B (not B minus) or better.

A student cannot take a course addressing the same material more than once to fulfill the requirement. Students should discuss the most appropriate courses to fill their elective requirements with their mentors prior to registering. This will ensure that they take the courses that will be most useful to them in their thesis research.

Supervised Teaching – BCH 599

An elective course that can be customized to the teaching needs. Approved to count towards the 6 elective credits required for BCH Ph.D. students but open to all PPBS students at all levels.

2 credits – Students **seeking teaching experience** participate in teaching under the tutelage of a faculty member. Activities can include: attending class, giving recitations, small group tutoring, writing exam questions, proctoring exams, and one-on-one mentoring with the faculty member teaching the course.

Students may participate in BCH 599 for less than 1 semester. However, overall, the level of participation should be consistent with the 2 credit hours load of this course. If desired, students may take this class more than once to gain additional teaching experience. However, only the first time the course is taken will it count towards the needed 6 credit hours of electives. The credits will still count towards the 72 hours of credits needed for graduation from the PhD program. BCH students must get approval from their mentor before signing up this class.

Research Proposal - BCH 565

The Research Proposal Exam Committee (RPEC)

For the purposes of the Research Proposal (BCH565), each Proposal Committee will be chaired by one of the members of the Graduate Affairs Committee; this Chair will be a full member of the Proposal Committee. Appointment of these Committee Chairs to the various Proposal Committees in any given year will be made by the Director of Graduate Affairs with consultation with the Department Chair. The RPEC Chair will serve as the Committee's **administrative head** ensuring that the student and the committee adhere to the Proposal Timetable; that both student and faculty are being responsive to this timetable and to the academic objectives of this process; and that discussions of the written drafts and the oral defense are objective and consistent with the Department's academic goals. The Graduate Affairs Committee member who serves as a Chair of a particular student RPEC will not have a dual role as a regular member of the same committee. In other words, if a student chooses a faculty who belongs to the GAC to become a member of the RPEC committee – they will not be the Chair. Although the graduate student Mentor will not be a participant in the review and evaluation of the student's written Research Proposal or of the Proposal's oral defense, it is expected that the Mentor will be **actively** and intellectually involved in this process by providing advice, guidance, direction, and support to his/her student.

The finalized RPEC thus will consist of a minimum of four graduate faculty members - three of whom (this includes the Chair) must have their primary appointment in the Department of Biochemistry. In addition, at least one committee member must have his/her **primary** appointment outside the Department. Members of the RPEC should be active members of the Graduate Faculty at UB. It is the responsibility of the student to put together the RPEC committee (sans the Chair) with the help and guidance of his/her mentor – it is strongly

advised that this be done **early in the fall semester**. If any committee member is unfamiliar with the BCH Oral defense process as the case may be for faculty who are participating in this process for the first time, the student should ensure that this guide document is made available to them at the time the committee is being set up.

Research Proposal: An Overview

The Research Proposal (BCH565), completed by potential doctoral candidates, is taken during the fourth semester of enrollment, in the Spring semester of the student's second year (which is also the Spring semester of the student's first year in the Department). The objectives of the proposal process are to:

- Develop the skill to search, read and evaluate the research literature.
- Develop the ability to interpret the results and conclusions of one research paper to the next logical step.
- Develop the skill to construct a hypothesis or model based on established results that is experimentally testable and a logical extension of the research that provided these results.
- Develop the skill to design a set of specific aims that logically test the hypothesis or model.
- Develop the skill to design a series of doable experiments that rationally address those aims.
- Develop the understanding of the experimental protocols adopted, the likely outcomes of these experiments, and their possible pitfalls.
- Develop the skill to present the above in clearly written established scientific format and to discuss the above in a formal and more informal setting (public defense and closed-door oral defense with the RPEC).

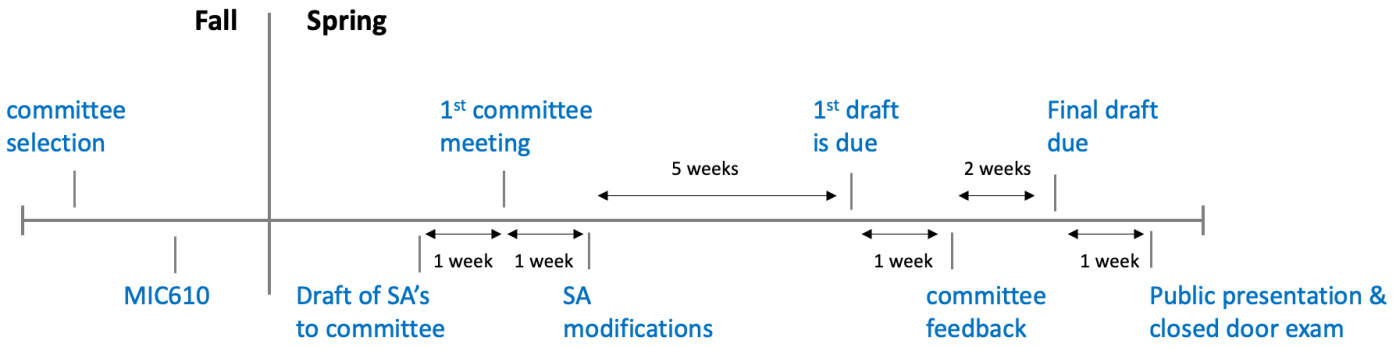
An additional comment about Application to Candidacy

The Research Proposal is the Department's "Preliminary Examination" for students who are enrolled in the doctoral program. According to the procedures in the Graduate School of the University, once a student has been successful in this "examination" and completed all required coursework, they can file the "Application for Candidacy" for the Doctoral Degree. This filing will be done after completion of the student's fourth semester, Filing and approval of this Application is important for two reasons. First, it establishes that the student has or will shortly complete all of the academic requirements for the degree (courses and exams). Second, the student is now considered "full-time" even if they are registered for only one credit hour/semester. Thus, completing the Research Proposal sets the student on their way to the final Doctoral degree.

It is recommended that when choosing the expected conferral date on the ATC that students select the date that coincides with 6 years of study; 1year in; PPBS; 5 years in BCH.

Research Proposal: Description and Process

During the Fall semester prior to the research proposal process, students will complete participation in a grant writing course (MIC610) and will complete selection of their graduate committee. The official research proposal process will begin early in the Spring semester of the second year with a presentation to the RPEC (including the Chair). The diagram below summarizes the full proposal timeline.



Research proposal timeline

One week prior to the first committee meeting, the student will provide a draft of a Specific Aims page that has been approved by the student's mentor. During this ~ 45 minutes presentation, the student will present an overview of the research in their lab, the objective of their thesis research within that context, and the proposed Specific Aims of the work they plan to complete directed toward that objective. This presentation will be evaluated by the student's Proposal Committee *specifically* for its suitability as a starting point for writing a Research Proposal. If this evaluation is positive and all members of RPEC are in agreement, the student may continue with writing the proposal. In some cases, this approval may be contingent on modification of the Specific Aims of the proposed research; such changes should be made and approved within one week of the Research Presentation. If the Committee concludes that the research presentation, the discussion of possible future experiments, and/or hypotheses to be tested were not adequate, the student will be given an opportunity to repeat the Presentation. The outcome and discussion points of the 1st RPEC meeting will be summarized by the Chair in a written document that will be provided to the student, committee members and the student advisor.

Next, the student will prepare and submit a written proposal to his/her Proposal Committee within 5 weeks of the 1st Research presentation, allowing for the one week for approval of any changes in the Specific Aims. The written proposal will follow the format of the NIH F31 fellowship (using the most updated guidelines) and will consist of the following sections (page limitations are maximums and are not meant to imply that each proposal must reach the maximum limits; they refer to single-spaced pages): Specific Aims, 1 page; Significance and Innovation, 1-2 pages; Approach, 4-5 pages; References, no limit. Figures and Tables will be incorporated directly into the text and are therefore included in the 7-page limit.

The Specific Aims should be a logical extension of published research from the mentor's lab and the broader research topic and should contain a brief but explicit statement of the hypothesis to be tested. As part of the Approach section the student should briefly describe the background of the project, critically evaluate the most pertinent existing knowledge, and specifically identify the problem with which the proposal is intended to address. This section should draw from the material described in the Research Presentation and incorporate any changes to the Aims suggested by the RPEC. The Approach should also describe how the Specific Aims can be accomplished. This section need not contain exquisite detail, but the student must be sufficiently conversant with the design and procedures to defend their proper application, discuss their limitations, and to describe probable results and their interpretations. The student should also be able to discuss the work proposed in the context of their field in general, *e.g.,* if the work proposed is to be on transcription initiation, the student

should be able to discuss transcription in general including mechanisms of regulation, the role of chromatin, and processing of the nascent mRNA. An outline of the research proposal is shown below. Upon request, students can also be provided with examples of exam proposals that have been successfully defended by past BCH students. Students are strongly encouraged to meet with their committee members individually during any stage of the exam if they need clarification or additional guidance.

The Written Research Proposal – Outline

- The written Proposal is to consist of 1 page of Specific Aims plus up to six additional pages that include the Significance, Innovation and Approach sections as is described in detail in the NIH guidelines for F31 applications. These page limits do not include literature citations.
- https://grants.nih.gov/grants/how-to-apply-application-guide/forms-h/fellowship-forms-h.pdf
- The Proposal must be single-spaced, using 11-point Arial, Helvetica, Palatino Linotype, or Georgia font and be fully-justified with 0.5 inch margins.
- Each page, except the first page, should be numbered (bottom center).
- Figures, figure legends and tables will be included within the body of the text following the format of NIH fellowship applications. The text plus all figures, figure legends and tables must fit into the page limits described above.

The final draft of the Proposal should be organized as follows, with **suggested** page lengths for each section:
- Specific Aims – 1 page (this page limit is fixed, since the Specific Aims may **not** be longer than 1 page)
- Significance – 0.5 to 1 page
- Approach, including relevant background or preliminary data obtained by the student, prior members of the student's lab or other laboratories, hypotheses, experiments to be done, experimental design (methods, briefly), expected outcomes (relevant to hypothesis/model), possible difficulties and alternative outcomes – 4-5 pages.
- Citations (not included in 7-page limit)

Typically, a Research Proposal will have 2 or 3 Specific Aims, each of which focuses on a relatively specific aspect or test of the hypothesis or model. An Aim *always* has at its core a specific, independent experimental approach, an actual experiment, expected experimental data, and interpretation of the data in terms of the hypothesis or model.

Within one week of receiving the written proposal, each member of the RPEC will return their copy of the document to the student along with a written evaluation. The evaluation should point out major problems to be addressed and corrections to be made, as needed. No grade is assigned at this point. Within two weeks after receiving the Proposal Committee's evaluation, the student must return a revised version to the Committee. The revision will be accompanied by a 1-page summary of changes that were made in response to committee feedback. The Committee will not return this version to the student but will proceed with the oral exam. If one or more Committee members feel that the quality of this second draft is unacceptable, they can request that the Committee meet to discuss these concerns. If all members of the Committee concur, the student can be given a "U" grade for the Research Proposal at that time without an oral defense. Students are strongly encouraged to meet individually with Proposal Committee members to discuss the revised version before the oral exam.

The Oral Exam will begin with a public presentation to the BCH department by the student. The specific date/time/place for the oral exam for each student will be set at the beginning of the Spring semester. To facilitate timely conclusion of this process, it is imperative that the student meet the various proposal preparation deadlines – this will be the responsibility of the student and the Chair of the committee. Any request by a student of change in the already set date will only be considered under special circumstances such as major illness. Following the presentation of their research proposal (~ 45 mins) and a Q&A session from the audience, the student will have a closed-door exam with the RPEC. The RPEC members will reserve their questions until the closed-door exam. The RPEC will question the student about the project: its rationale, choice of experiments and experimental design, exploring possible shortcomings of the experimental protocols and possible alternative, negative, or false positive results, and evaluate the student's knowledge of the general area of the proposal, *e.g.,* if on bacterial replication, how does this compare to eukaryotic replication? The objective of the Oral Exam is not simply to have the student recite orally what has been presented in writing, but to examine the student's overall grasp of the research area in which the lab works and about which the Proposal is written.

The Proposal Committee including the Chair will evaluate the oral presentation, the written proposal and the Q&A session in the closed-door meeting and decide upon one of the following courses of action:

1. An unconditional pass (S)
2. A conditional pass - an S grade will be given when limited written revisions or responses to specific questions are deemed unsatisfactory by the Committee - the oral exam will not be repeated. Instead, the Committee will ask for specific revisions or additional material to address any shortcomings. The timeline for revisions or responses is determined by the RPEC chair.
3. An incomplete - the written proposal must be revised and another oral exam must be taken. The student has two weeks to submit the revisions. An incomplete can be given once only.
4. An Unsatisfactory (U). In this case, the student will be dismissed from the Biochemistry PhD program.

An S *or U* grade for BCH 565 must be submitted within 12 weeks of the Doctoral Student Seminar presentation. Failure to do so (to adhere to the above time-table) *is* grounds for dismissal of the student from the doctoral program. The RPEC final determination will be submitted to the Assistant to the Chair as a Research Proposal Report Form (Appendix A).

Research Progress - BCH 703

The student's Dissertation Committee will meet at least once yearly (or more often at the discretion of the student/mentor and/or committee). This will typically occur during the Fall semester of each year. Students are to register for BCH 703 each Fall semester. beginning in the second year and until completion of the program. Meetings should continue up to the time the Mentor and Committee determine the student can be encouraged to prepare the Doctoral Thesis for written evaluation and oral defense. Results of dissertation committee meetings will be summarized on the annual thesis committee form (Appendix B) and will include: (a) courses taken and grade; (b) progress toward goals stated the previous year; (c) goals for the coming year; (d) complete citation to all abstracts and papers published in preceding year; (e) indication of whether progress toward thesis is satisfactory. If progress is deemed unsatisfactory, the basis for this judgment, and its potential consequences should be explicitly stated. Students are required to attach an Individual Development Plan (IDP) during their annual committee meeting. The IDP should be designed in consultation with the mentor. This is generally targeted to short timeframes like the next 6-12 months and updated periodically. This may be

facilitated by the use of online resources such as myIDP (http://myidp.sciencecareers.org/). Students are required to present their IDP plans to their thesis committee at year's meeting to get feedback on the appropriateness of the plan and determine if any changes are needed.

The thesis report form must be completed after each thesis committee meeting, and an appropriately signed copy put in the student's departmental office file. This form will be completed by the thesis advisor and reviewed and signed by the advisor, dissertation committee members and student. Thesis committee reports will be copied to all committee members. This written report must be submitted before a grade can be filed for BCH 703. Any Incomplete (I) grades in BCH 703 arising from failure to have a thesis committee meeting must be removed no later than the start of the next (Spring) semester.

XIII. Academic Standards for the Ph.D. Program

Grading in Courses - BCH 504, 565, 701, 702, and 703 will receive S or U grades. BCH 507, 508, 512, 519, 603, 607, 611, and any other Special Topics and electives will receive letter grades.

Academic Standing - The following are grounds for probation, dismissal, and/or non-acceptance into the Biochemistry Department based on PPBS grades or other graduate level grades prior to consideration by our department: (i) Overall GPA below 3.0 in graduate courses. (ii) A grade lower than a B in any required course applied towards the degree. (iii) A U or F grade in any graduate course. (iv)Failure to achieve an S grade in all lab rotations. (v) Failure to receive an S grade in the Research Proposal within 12 weeks of public oral presentation. (vi) an Unsatisfactory/U grade in the Research Proposal process results in mandatory re-take or dismissal. In addition, a second U grade in the Research Proposal results in automatic dismissal from the program.

XIV. Financial Aid

A. As a Doctoral Candidate you will receive a $35,000 stipend derived from State, research grant funds, or fellowships.

B. University Fellowships: Presidential and Graduate School
Fellowships are awarded by the Graduate School. It is the responsibility of the Director of Graduate Studies, in conjunction with the Graduate Affairs Committee in the case of new students, to submit applications for these fellowships to the Graduate School according to a timetable established by the Graduate School, normally late February for the following year.

C. Grant support. After the end of the first year, a student's stipend normally will be provided from the grant funds of the student's Mentor.

D. Tuition Scholarships. Tuition Scholarships can be granted to all full-time students receiving a stipend. Full tuition scholarships will normally cover the entire course obligation the first year; twelve hours of course work until the ATC is filed; and reduced credit hours per semester after that, unless more credits are required for graduation. The maximum number of credit hours to be covered under the scholarship is 72.

Effective 1/2019 the BCH department will cover tuition fees for 2nd year Ph.D. students (first year matriculated into the department) as long as funds are available. This does not apply to BCH students whose mentor is in a different department.

E. Time limit for support and tuition waivers. Students are expected to complete their Ph.D. requirements in 5-6 years. This will normally be the maximum time financial support and tuition waivers (if available) will be provided. Under extenuating circumstances, a student and/or the Mentor may petition the Graduate Affairs Committee for relaxation of this requirement.

F. Funding for Conferences/Travel. Departmental funding up to $500.00 may be made available for Ph.D. students who present a poster or oral presentation at scientific conferences. Requests should be submitted in writing to the DGS for review.

XV. Filing for Ph.D. Candidacy

After completion of the fourth semester (the second semester in the Department Program **Ph.D. students** must complete an Application to Candidacy form and have it approved by the Director of Graduate Studies and committee members. The Application then goes to the Assistant to the Chair for final review and submission to the graduate school.

XVI. Doctoral Thesis Defense and Thesis Research Presentation.

Please review information from the graduate school regarding electronic thesis and dissertation submission guidelines:
http://www.buffalo.edu/grad/succeed/graduate/electronic-submission.html

The Doctoral Thesis Defense will consist of two presentations by the candidate. First, the written thesis will be reviewed by the Thesis Committee and by the Outside Reader. With the written approval of the Outside Reader (Letter to the Director of Graduate Affairs, see below) and oral approval by all members of the Thesis Committee, the student will ask the Administrative Assistant for Graduate Affairs to schedule an Oral Presentation of the Thesis to be held with the Thesis Committee; attendance by the Outside Reader is encouraged but not required. Second, following a successful Oral Presentation to the Thesis Committee by the student, the Administrative Assistant will schedule an open Departmental Thesis Seminar at which time the student will present their doctoral research. The notice should go out to faculty and students at least 2 weeks prior to the defense occurring.

Successful completion of both presentations will constitute a successful defense of the Doctoral Thesis as indicated by the completion of the Graduate School M Form.

An Outside Reader is at least a tenure-track faculty member (or equivalent) in another Department in the University or at another academic or research institution. The Outside Reader cannot be a faculty member that holds a secondary faculty appointment in Biochemistry. The Thesis Approval Letter can be submitted as an electronic file but must be on institutional letterhead and it must state that the thesis is approved for Oral Presentation to the Thesis Committee. If the Outside Reader does not attend the Oral Presentation and/or Thesis Seminar, they should be encouraged to submit written questions to the Thesis advisor/ Director of Graduate Affairs to be presented to the student at the Oral Presentation.

The time-table for Doctoral Thesis Review is given below based on the following two considerations: 1) the Thesis Committee members and Outside Reader must have at least 3 weeks to review the thesis and approve it for Oral Presentation and 2) at least one week must separate the Oral Presentation from the Departmental Thesis Seminar.

The Thesis, as approved by the student's mentor, must be received by the Thesis Committee members and Outside Reader no later than 4 weeks prior to the projected date for the Departmental Thesis Seminar. This Thesis Draft must be in full compliance with the format required by the Graduate School.

The Presentation to the Thesis Committee must be held a minimum of 1 week prior to the projected date for the Departmental Thesis Seminar.

There are three administrative additions to the Doctoral Thesis Review as follows:

1) Progress towards a successful Defense of Thesis will be monitored by the GAC.

2) The standard Thesis Research Presentation form will be used by the Thesis Committee to note approval of the dissertation and Oral Presentation; this approval is required for the student to proceed to their Department Thesis Seminar presentation.

3) The Outside Reader will be arranged by the candidate and mentor, but a formal request to serve as Outside Reader will come by letter from the Director of Graduate Studies.

XVII. Student Participation in Departmental Activities

1. Students are expected to attend the weekly Biochemistry Seminar Series. Your attendance should be noted on the attendance sign-in sheet. If you cannot attend a seminar, please notify the DGS via email. Senior students writing their thesis may receive permission to not attend seminar. It is also highly encouraged to have lunch with our speakers. It is a great networking opportunity.

2. Students are expected to participate actively in the evaluation of candidates for faculty positions. In addition to attending the candidates' seminars, the students meet with prospective faculty members to discuss their research and ideas concerning graduate training. Written evaluations solicited from students are useful to the search committees in assessing teaching abilities, communication skills and interpersonal skills.

3. Graduate students meet with applicants to our graduate program who visit the department to discuss the graduate program and life in Buffalo.

4 Input from graduate students on other issues of the graduate program is encouraged and may be given to the Director of Graduate Studies, a member of the GAC, and/or the Chair of the Biochemistry Department.

5 It is important that graduate students have opportunities to present their thesis work on an ongoing basis and in an internal forum other than the thesis defense. Therefore, each student in year's three or beyond will present a ~ 15–20-minute talk (plus time for questions and answers) on their research during the annual departmental research day/retreat. This research day will also include a talk by an outside speaker, to be invited by the students. This research day will take place ~~at~~ the end of spring semester.

XVIII. Student Leave Policies

1. Vacation Leave

Departmental policy is that doctoral student stipend and tuition support be provided by the student's thesis advisor. These funds typically are administered by the Research Foundation of the University at Buffalo. Therefore, doctoral students are considered Research Foundation employees. The fringe benefits offered through the Research Foundation (*e.g.* health insurance, Student Health visits) are detailed in literature made available to all new students.

As Research Foundation employees, doctoral students also are entitled to annual leave appropriate to their time-in-service. As students, they do fill out electronic time sheets, but do not receive actual leave accruals. However, Department policy is that students will have available to them 2 weeks of leave per year to use for vacation. Those students who need a longer vacation period because of extended travel times may pool two years allowance into a single trip; otherwise, the annual leave time shall be non-accumulating. In regards to vacation leave, the period chosen should result from discussion between the student and mentor and should be consistent with the educational and research commitments associated with the student's academic and research objectives and responsibilities. Students shall also be allowed reasonable medical absences for sickness or treatment. In such circumstances, the student and their mentor may agree on a virtual working period (*e.g.*, writing toward a manuscript or the thesis) that will not be considered vacation or leave time. Time spent fulfilling Departmental assignments or responsibilities are also not considered vacation or leave time (*e.g.*, assisting in courses, student mentoring and recruitment, organizing research day). These policies also apply to Department of Biochemistry doctoral students paid from State funds.

Two principles shall be followed by the student and mentor in discussing leave time: 1) the student and mentor have made a mutual commitment to training and research objectives; and 2) achieving these mutually reinforcing objectives requires flexibility in effort and time-of-effort. Although the mentor cannot forcibly deny a leave request, they can certainly view such a request as inconsistent with the student's commitment to these training and/or research objectives. If disagreements arise which student and mentor are unable to resolve, the Department Chair and Director of Graduate Studies should be informed by either the student or mentor or both and an effort will be made to mediate the dispute.

2. Family Medical Leave

Students requesting Family Medical leave due to birth of a child, assumption of guardianship of a child, or care for an immediate family member should contact Human Resources determination of benefits and additional information.

https://www.buffalo.edu/administrative-services/forms-catalog/hr/fmla-request-for-leave.html

XIX. Petitions

Petitions must be submitted to the Director of Graduate Studies and/or the Graduate School (and approved by the Divisional Committee in the latter case) for the following purposes:

A. Extension of time limit for completion of degree. Students must submit the Petition for an Extension of the Time Limit to Complete a Graduate Degree Program justifying reasons for an extension beyond seven years for completion of the Ph.D. A written summary of the following must be attached to this petition:

The cause of delay in completion; detailed description of work completed thus far; detailed month-to-month plan of work to be completed from now until the new anticipated completion date; A written endorsement from the major advisor regarding work completed thus far and feasibility of a student's completion plan.

B. Graduate Tuition Scholarships:
Students enrolled in a doctoral degree program are eligible to receive tuition scholarship support for a maximum of eight semesters, including any semesters of such support while enrolled in a master's program.

A student my not receive tuition scholarship support for credits in excess of the minimum required for his/her degree program. Although there are variations among graduate programs in terms of minimum required credit hours, normally this limit represents a total of 72 hours for a PhD program.

Students may petition for extension of the normal time and credit hour limits for tuition scholarship support. However, if approved for a given semester, such an extension will normally provide for only one credit hour of tuition support. This extension does not guarantee additional tuition scholarship funding to the unit.

C. Leave of absence. If a student wishes to take a leave of absence a petition must be submitted detailing the reasons for the leave. The petition must be filed prior to the semester that is requested for leave. Students on a Leave of Absence cannot be paid because they are not in a "current" student status.

D. Change of status. A petition to change status from Ph.D. candidate to M.S. or vice versa must be submitted in the form of a letter to the Director of Graduate Studies. A copy of this letter and the approval must accompany the student's program form when it is submitted to the

Graduate School. A petition for a switch from the M.S. to the Ph.D. program must be subject to the admissions process.

E. Change of Dissertation Advisor. The same procedure for a letter is followed as in D, above.

F. Course requirements. If a student requests that an exception be made to the normal course requirements, the same procedure is followed as in D, above.

XX. Grievance Procedure

Students should feel free to contact the Director of Graduate Studies or the Chair of the Department on personal and academic matters or with grievances. On matters under departmental jurisdiction in which a student believes they have been aggrieved, a formal grievance review may be requested. The request must be in writing from the student concerned to the Chair of the Department and must be filed within one month of the alleged grievance. It must clearly state the charge of grievance, its effects, and summarize the particulars concerning it. The Chair of the Department, in consultation with the concerned parties, will appoint an *ad hoc* committee with student representation to investigate the grievance. The *ad hoc* committee's action is restricted to procedures or administrative matters, as opposed to judgments of academic performance. All hearings of the Grievance Committee will be closed. No formal minutes will be taken. The committee will report its recommendation for resolution of the grievance within one week after filing. Grievance reviews for graduate students are also available through the Graduate School.

XXI. Graduate Student Association

The Biochemistry Graduate Student Association meet on a formal and informal basis and organize department-wide events, including the annual Biochemistry Research Day.

The purpose of the Biochemistry GSA shall be to act, through the graduate students in the Biochemistry Department of the State University of New York at Buffalo, to make decisions about the affairs of the Biochemistry graduate students in their best interest. The Biochemistry GSA will promote and advance diversity in professional connections, scientific perspectives and develop practical skills for members who seek to advance their academic and/or industrial careers.

The Biochemistry GSA offers a supportive environment where you can:

- Discuss research progress and problems in an informal setting
- Improve your presentation skills
- Hone your job interview skills
- Practice your thesis defense
- Socialize with your peers
- Organize Alternative Career Options Presentations

The Biochemistry graduate students also organize our department's holiday party and summer picnic.

Effective Fall 2021 a new student group has been created that includes all gradaute students in the Biomedical Sciences: Biomedical Graduate Student Government (BGSG).

The Biomedical Graduate Student Government (BGSG), is a group of graduate students who aim to advocate for the betterment and welfare of graduate students in departments associated with the Jacobs School of Medicine and Biomedical Sciences (JSMBS) and the PhD Program in Biomedical Sciences (PPBS). Our goal is to provide a safe space for students to voice their concerns about issues that affect the successful advancement of their scientific careers, whether it be academic, social, or emotional. We intend to address these issues by creating strategies and proposals that will be communicated to the administration in the greater JSMBS community.

XXII. Commencement Awards

The Biochemistry Graduate Student Research Achievement Award

This award is for recognizing outstanding research performed by a Graduate student in the Department of Biochemistry as demonstrated by their publication record, presentations at national/international meetings and overall quality of dissertation thesis, if available. The typical awardee will be a senior graduate student in their final year or someone recently graduated. A student can only be nominated once. MD-Ph.D. students are eligible in the same year that they defend their thesis and return to medical school.

The Dean's Award for Outstanding Dissertation Research

Demonstrated excellence in research – nomination by Department Chair.
Nominations are limited to one candidate per JSMBS basic science department/program. The following dossier must be submitted **electronically** to Beth White (bethw@buffalo.edu):

1. Letter of nomination from Department/Program Chair/Director
2. CV of candidate
3. Cumulative GPA
4. Number of years in the program
5. Number of publications (separate abstracts from peer review articles)
6. Honors and/or Awards
7. Presentations at national meetings (abstracts, poster, platform, level of review)
8. Date of Degree Conferral
9. PDF of thesis

Appendix A: Research Proposal (BCH565) Report Form
Appendix B: Research in Progress Form (BCH703)

Appendix A

Department of Biochemistry
Research Proposal (BCH565) Report Form

Date of Seminar defense and proposal: _____

Student (printed name): _____

Mentor (printed name): _____

RPEC Chair: _____ _____
Printed name Signature

Thesis Committee Members:

_____ _____ _____
Printed name Dept. Signature

_____ _____ _____
Printed name Dept. Signature

_____ _____ _____
Printed name Dept. Signature

Committee decision (unconditional pass, S grade; conditional pass, S grade given following limited written changes in the proposal; incomplete, significant rewriting of proposal with follow-up oral defense; U grade, unsatisfactory defense of a poorly conceived written proposal).

Grade: _____

Significant problems and/or suggestions discussed by committee (if any):

I have read and am fully aware of my Committee's evaluation of my written proposal and its oral defense.

_____ _____ _____
Student name (printed) Signature Date

Appendix B:

Department of Biochemistry
Annual Ph.D. Research in Progress Committee Report (BCH 703)

This BCH703 report form must be completed after each thesis committee meeting, and an appropriately signed copy put in the student's departmental office file. This form will be completed by the thesis advisor and reviewed and signed by the advisor, dissertation committee members and student. GAC will also review. Thesis committee reports will be copied to all committee members. This written report must be submitted before a grade can be filed for BCH 703. Any Incomplete (I) grades in BCH 703 arising from failure to have a thesis committee meeting must be removed no later than the start of the next (Spring) semester.

Student: _____
Advisor: _____
Date of meeting: _____

Student Signature: _____
Advisor Signature: _____
Committee Member:_____
Committee Member:_____
Committee Member:_____
Committee Member:_____

Current GPA:_____
Courses Taken and Grades; If required coursework is complete, please note below and leave blank:

Remaining Course Work if Applicable:

Date of qualifying exam: _____
Expected date of dissertation defense:_____
Thesis Title (tentative): _____

Please select/check applicable option. Progress toward thesis is:

Excellent_____
the student has met/exceeded all goals and expectations since the last committee meeting
Good_____
the student has met most of the goals and expectations since the last committee meeting
Poor_____
the student has met few of the goals and expectations since the last committee meeting and the committee is concerned about the student's progress
Unsatisfactory _____
the student has made little/no concrete progress

<u>If progress is Poor or Unsatisfactory,</u> the basis for this judgment, and its potential consequences should be explicitly stated. The committee should attach remedial action and steps to meet satisfactory performance.

Summary of major advances since last meeting:

Significant problems and suggestions discussed by committee (if any):

Goals; Progress towards goals stated the previous year:

Complete Citation to all abstracts and papers published in preceding year:

Grants/Proposals Applied For (NSF/NIH Fellowships):

Outcomes for Grants/Proposals Applied For:

Abstracts Accepted/Presentations at Conferences:

Participation in Teaching:

Honors/Awards Received, include Dates:

Service to the Department, School, UB, Professional Organization:

IDP Individual Development Plan Attached (Required); Updated and discussed with committee and advisor:
YES:
NO:

Please return complete and signed form to Department Office: Beth O'Brocta, 955 Main, Suite 4102F; eobrocta@buffalo.edu