Jacobs School of Medicine and Biomedical Sciences
University at Buffalo

GUIDELINES FOR MASTER OF ART'S (MA) GRADUATE PROGRAM IN BIOCHEMISTRY AY 2023-2024

Chairman:
Dr. Mark O'Brian
mrobrian@buffalo.edu 716-829-3200

Director of Graduate Studies:
Dr. D. Fernando Estrada
dfestrad@buffalo.edu
4222 JSMBS; 716-829-2767

Graduate Affairs Committee:
Dr. Marc Halfon
mshalfon@buffalo.edu
5128 JSMBS; 716-829-3126

Dr. Jennifer Surtees
jsurtees@buffalo.edu
4215 JSMBS; 716-829-6083

Master's Program Graduate Coordinator

M. Sara Thomas msthomas@buffalo.edu

4102E JSMSB; 718-829-3890

I. Admission Requirements

A Bachelor of Arts or Science degree is required. A background in biologic and/or chemical science, with some physical chemistry and mathematics, including calculus, is typically required for admission. Master's candidates are admitted through The Graduate School Electronic Application Manager System - Slate. Applications are assessed by the Graduate Affairs Committee (GAC).

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. Student Classification

Matriculating students pursue a course of study that will lead to a Master of Arts (MA) degree. The master's degree requires a minimum of 30 credit hours.

IV. The Graduate Affairs Committee (GAC)

A Graduate Affairs Committee (GAC), chaired by the Director of Graduate Studies (DGS) 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.

V. Program Learning Outcomes

Enrolled students will acquire, expand upon, and deepen knowledge of the biomedical sciences beyond that acquired during undergraduate studies.

Enrolled students will plan and conduct research on a specific project under the guidance of an advisor they have chosen.

Upon degree conferral, students will have gained proficiency in basic laboratory techniques, critical evaluation of scientific literature and be able to apply scientific methods to the processes of experimentation and hypothesis testing.

Graduates will be able to effectively communicate the principles of scientific reasoning and data analysis in both written and oral forums.

Graduating students will develop skills that improve confidence and identity, strengthen personal resources, and ultimately gain better understanding and suitability of the various career paths in the academic or industry setting.

VI. Student Advisors

During the first semester, students are normally advised on academic matters by the Director of Graduate Studies (DGS). The DGS will advise the student on any academic matters concerning classwork and will also offer guidance on choosing an appropriate research rotation and mentor for the MA degree. Students are also encouraged to consult with the Graduate Coordinator and other faculty members, as needed or desired. It is expected that by the end of the first Fall semester, MA students will have chosen their research advisor or mentor. The mentor should have a **primary** or **secondary** appointment in the Biochemistry department. From that time on, the mentor will be the primary advisor for the student, along with a member of the Graduate Affairs Committee, who will be assigned to the student to provide guidance as needed and will serve on the student's Master's Committee.

The Master's Committee is chaired by the mentor, and consists of a minimum of three graduate faculty - the mentor, a member of the Graduate Affairs Committee (appointed by the DGS) and an additional member whose expertise is relevant to the area of research the student is planning to complete. The Biochemistry Department Chair is an *ex officio* member of all Master's Committees and can resolve disputes if necessary.

VII. Course Requirements for the Master of Arts Degree

The master's degree requires a minimum of 30 credit hours that include both academic course work as well as research. In addition to these courses, students must register for at least 1 elective course to be chosen in consultation with the mentor on a topic most relevant to the research. These can be Biochemistry courses or other courses offered by the University. In subsequent semesters students should enroll in BCH 597 –master's Research.

VIII. The Curriculum for the Master of Arts Degree

FIRST SEMESTER - FALL

Course Number	Title	Credits
BMS 501	**Cell Biology**	**4**
BCH 503	**Biochemical Principles**	**4**
BCH 505 A	**Lab Rotation**	**3**
BCH 505 B	**Lab Rotation**	**3**
	TOTAL HOURS	**14**

SECOND/THIRD SEMESTER SPRING †

*** ANY TWO OF THE FOLLOWING:**

Spring Options:

***BCH 507**	**Protein Structure Function**	**2-3**
***BCH 508**	**Biochemistry of Gene Expression**	**2**
***BCH 519**	**Introduction to Bioinformatics & Computational Biology**	**3**

Fall Options:

***GGB 502**	**Essentials of Genetics & Genomics**	**3**
***BCH 512**	**Developmental Genomics & Stem Cell Biology**	**3**
***BCH 603**	**Signaling and Disease**	**2**
***BCH 607**	**DNA Replication & Repair**	**2**
***BCH 611**	**Advanced Microbial Genetics**	**2**

(1) additional elective course to be chosen in consultation with the mentor and can include one of the above noted courses

Continuous enrollment in subsequent semesters

BCH 597	master's Research	1-9

Continuous enrollment in spring semesters

BCH 504	Graduate Student Seminar	1

†Most MA students can complete their required coursework in the second semester. This allows students an entire year to complete laboratory research, without needing to worry about classes. However, it is possible for a student to take a class in their third semester (Fall of second year), if it better fits their research interests. Master's students are eligible to be certified full-time status after completion of required courses. Certification of full-time status is available for 2 semesters. Additional semesters would require a petition to the graduate school.

Master's students are encouraged to use the HUB Student Center. Students have self-service access to clearly defined program requirements through their HUB Student Center via the Academic Advisment Report (AAR). The AAR is an advising tool that tracks student progress toward graduation showing how completed courses and future registration will fulfill degree requirements. By utilizing the HUB, students have improved academic planning, and as a result, potentially reduce time to degree completion.

HUB Student Center Training Guides can be found here: https://registrar.buffalo.edu/hub/

IX. Description of Course Work

The courses introduce students to the fundamental facts and principles of modern biochemistry. Topics covered include the following: genetics, genomics, enzymology, protein structure, and biophysical methods used to examine protein conformation; genetics; molecular biology; membranes and lipid chemistry; metabolism; hormones and principles and practices used in computational analysis of DNA and protein sequences. The exact topics to

be covered will be governed by which choices a student makes among the courses that may be taken.

These courses will progressively deliver selected material in depth and equip students for experimental science by introducing them to the critical use of the literature. The later courses will be oriented towards problem solving. Where appropriate, the emphasis will be placed on reading and discussing the primary literature, both historical and current, i.e. in-class discussion of outside reading. Evaluation of students' performance may include in-class written quizzes or oral exams and midterm and/or final exams.

Academic Standing

Students are expected to obtain a grade of B or better in all required courses and to maintain a grade point average (GPA) of 3.0 or better. A grade of B minus (B-) or below in a required course may be grounds for dismissal from the program and will be a matter of discussion by the Graduate Affairs Committee of the Department. An overall GPA of lower than 3.0 will result in academic probation. A student on academic probation has 1 semester to bring his/her GPA to 3.0. Failure to do so will result in dismissal from the program.

Laboratory Rotations – BCH 505 A and B

Prior to the lab rotation start, students are highly encouraged to seek help from the DGS in deciding on the best possible laboratories that suits their research interests. It is the responsibility of the student to identify and meet the faculty with whom they would like to rotate and arrange a rotation. Each rotation will last for 6 weeks. The expectation is 20 hours per week in the lab; the duration and time to be set up will be in consultation with the lab mentor and student and will take into account the student's course schedule.

Students will rotate through (2) research laboratories, 6 weeks for each rotation.

BCH 505A Lab Rotation dates: 9/18/2023 – 10/27/23

BCH 505B Lab Rotation dates: 10/30/23 – 12/8/23

All students should have found a lab in which to do their research by the end of the fall semester and are required to notify the DGS of their decision.

The rotation is an extremely important aspect of the first-year experience. The purposes of the rotations are to introduce students to laboratory research, to teach them a variety of lab techniques that they may draw on throughout their careers, to acquaint them with individual faculty and to provide them with information that will be essential in their selection of mentors. Students are expected to integrate into the lab research team during each rotation. 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. Selection of mentors for students will require agreement of **both the student** and the **proposed mentor**.

Research Progress

In the early part of the Spring semester of the first year when a student will have chosen a mentor and begun a research project, the student is required to meet with their mentor to go over the proposed research project. This meeting should focus on relevant background information for the proposed project, identification of the question(s) to be addressed in the research, and the proposed aims and techniques to be used.

The student should plan on having a formal master's committee meeting before the end of the spring semester/first year in the program. The primary goal of this committee meeting is to make sure that the student is making progress in the laboratory and has a research project lined up. The committee will ensure that the student is on track with the required coursework and that the research to be pursued in the laboratory of his/her mentor in the second year is well planned and appropriate for a master's Project.

A report form must be completed after the master's committee meeting, and an appropriately signed copy put in the student's departmental office file. This form will be completed by the mentor and reviewed and signed by the mentor, the master's committee members and the student.

The MA Student may also have a 2nd committee meeting, if advised by the mentor and/or the master's Committee Members, particularly in situations where it is deemed that progress is unsatisfactory and/or the student would benefit from a formal presentation of their research.

Final Research Report

Students in the Biochemistry master's Program will, with the advice of their mentor and Master's Committee, submit a final Research Report which is required for degree conferral.

The Final Report document should be arranged to include a sections on (1) background material necessary to understand the significance and impact of the project and information on what was already known prior to the time the student began his/her research, (2) a clear statement of the question that the project was attempting to answer with one or more Specific Aims, (3) a description of the Materials and Methods used in the Research Project, (4) a description of results obtained and (5) a discussion of how the research has answered the question posed and how that fits into the bigger picture of the scientific area addressed as well as a description of future directions that could be taken to further the particular line of enquiry. It is understood that some students may have made more progress than others due to technical issues or other considerations. However, even if technical challenges prevented progress, the student should describe approaches tested to overcome these challenges and how or why they worked or did not work.

The master's Committee must approve the Final Report before a student can graduate. Since revisions may be requested by the committee, the student should plan to submit the final report at least 1-2 months prior to the time when all paperwork needs to be submitted for graduation.

X. Public Presentation of Research

Part of 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 two components as described below.

Course Registration and Course Credit Requirements

BCH 504 – Graduate Student Seminar (1 credit course). Students are required to register for BCH 504 each Spring semester. Although registered and required to attend the presentations, master's students will not present in this class, but are encouraged to be active participants by giving comments and asking questions. Master's students should observe the general formats for putting together effective oral presentations with sufficient background material for the audience to understand and clear explanations of the need for the research, the aims of the project, the results obtained and the conclusions.

Biochemistry Department Research Day

Biochemistry Research Day typically takes place near the end of the Spring Semester. All students are required to attend and present their research. In their first year in the program, MA students will not present, but will observe and take notes on oral and poster presentations by BCH PhD students to understand the general format and to get a better idea of what makes a good presentation. At the end of their second year in the program, master's students are required to present a poster of their research, which will include descriptions of the project to those who attend the poster session. Some students may complete their MA degree one and a half rather than 2 years in which case they will present a poster to the department at the end of their program, rather than at the Departmental Research Day.

XI. Financial Aid

Normally there is neither financial support nor tuition waivers for master's students. Funding for Conferences/Travel: Departmental funding up to $500 may be available for MA students who present a poster or oral presentation at a conference. Requests should be submitted in writing to the Deparment Chairperson.

XII. Application for Graduation-Degree Conferral

Students Apply for Graduation in the HUB Student Center – Select Apply for Graduation. Select the term in which you will have met all degree requirements. This usually occurs in the spring semester, 2nd year.
http://www.buffalo.edu/grad/succeed/graduate/apply-for-graduation.html

Deadlines to Apply for Graduation in HUB Graduation Term	Application Deadline	Conferral Date
Fall	October 15	February 1
Spring	February 22	June 1
Summer	July 15	August 31

XIII. Student Participation in Departmental Activities

In addition to participating in formal courses and research, students participate in the Department in numerous additional ways.

1. Students may participate in departmental teaching by registering for one credit hour of BCH 599 - Supervised Teaching. This is especially useful for students who envision a future career in teaching at the university level.

2 Students help to plan and organize the Annual Biochemistry Research Day as well as participating by presenting their research. Students identify and invite the keynote speaker for this event and host the speaker while he/she is in Buffalo.

3 Students plan and organize several department social events including the December Holiday Party and the Summer Picnic.

4 Input from graduate students on any aspects of graduate life or issues in 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 When new faculty are being recruited, students are expected to participate actively in the evaluation of candidates for these 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.

6 Student attendance at weekly Departmental seminars (not including BCH504, which is required) will be determined on a case by case basis between the student and their advisor.

XIV. Student Leave Policies

1. Vacation Leave

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. However, Master's students who are not U.S. citizens and who travel home to foreign countries should be aware that visa renewals may take extensive time to process or may be rejected. Thus, it is not generally recommended that students travel outside the country unless necessary. 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. Time spent fulfilling Departmental assignments or responsibilities are not considered vacation or leave time (*e.g.*, assisting in courses, student mentoring and recruitment, organizing Research Day).

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, she or he 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.

XV. Petitions

Petitions must be submitted to the Assistant to the Director of Graduate Studies and/or the Graduate School for the following purposes:

A. Extension of time limit for completion of degree. Students must submit a petition listing justifying reasons for an extension beyond two years for completion of the M.A. degrees.

B. Leave of absence. If a student wishes to take a leave of absence a petition must be submitted detailing the reasons for the leave.

C. Change of status. A petition to change status from M.A. status to PhD status (upon approval by the mentor) must be submitted in the form of a letter to the Director of Graduate Studies. The Graduate Affairs Committee will discuss the petition and either approve or deny it. A copy of the petition letter and the Graduate Affairs Committee approval must accompany the student's program form when it is submitted to the Graduate School. A petition for a switch from the M.A. to the Ph.D. program is subject to the admissions process and will only be approved if the student has shown adequate abilities in their coursework and research.

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

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

XVI. Grievance Procedure

Students should feel free to contact the Director of Graduate Studies (DGS) or the Chair of the Department on 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.

XVII. 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 presentation skills
- Hone job interview skills
- Practice 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.