

PROGRAM IN MOLECULAR AND CELLULAR BIOLOGY

UNIVERSITY OF MASSACHUSETTS AMHERST

ACADEMIC REQUIREMENTS, POLICIES AND PROCEDURES

TABLE OF CONTENTS

- A. ADMISSIONS 4**
 - I. General4**
 - II. Admission Under Special Circumstances.....4**
 - a. Admission of Students with Deficiencies in Formal Coursework 4
 - b. Exemptions from Core Courses 4
- B. REQUIREMENTS FOR THE Ph.D. DEGREE..... 5**
 - I. Courses5**
 - a. Formal Coursework 5
 - b. Laboratory Rotation 5
 - c. Journal Clubs..... 6
 - d. Seminars..... 6
 - e. Teaching Assistantship Requirement 7
 - f. Evaluation of Student Progress in First Year 7
 - II. Evaluation of Student Progress After the First Year.....7**
 - III. Fellowship Application.....7**
 - IV. Comprehensive Examination7**
 - V. Dissertation and Final Oral Examination/Dissertation Defense10**
 - a. Dissertation Committee 10
 - b. Dissertation Prospectus/Outline 10
 - c. Data Defense 10
 - d. Dissertation and Final Oral Examination/Dissertation Defense 10
 - VI. Period of Study11**
 - VI. Summary of Required Coursework and Milestone Requirements for the Ph.D. Degree.....11**
 - a. Courses/Credits 11
 - b. Original Research Proposal/Comprehensive Examination..... 12
 - c. Prospectus 12
 - d. Data Defense 12
 - e. Dissertation and Final Examination..... 12
- C. REQUIREMENTS FOR THE FAST-TRACK THESIS MASTER'S DEGREE..... 13**
 - I. Courses13**
 - a. Formal Coursework 13
 - b. Journal Clubs 13
 - c. Seminars 13
 - d. Colloquium 13
 - II. Thesis and Final Oral Examination/Thesis Defense13**
 - a. Thesis Committee..... 13
 - b. Thesis Outline..... 14
 - c. Thesis and Final Oral Examination/Thesis Defense 14
 - III. Credits14**

IV. Summary of Requirements for the Thesis Master's Degree14

 a. Courses 14

 b. Master’s Outline..... 15

 c. Master’s Thesis and Defense 15

D. STUDENT TRANSFERRED FROM THE PH.D. TRACK TO M.S. TRACK 16

 I. Procedure and Requirements for Students who have not passed the Original Research Proposal16

 II. Procedure and Requirements for Students who have passed the Original Research Proposal16

 III. Evaluation of Candidate for Readmission to the Ph.D. Track17

 IV. Application for Readmission to the Ph.D. Track.....17

E. STUDENTS TRANSFERRING FROM FAST-TRACK M.S. TO PH.D. TRACK..... 18

 Procedure and requirements for transfer during the second year of the M.S.....18

Appendix 1. DEADLINES FOR ORIGINAL RESEARCH PROPOSAL/ COMPREHENSIVE EXAM* 19

Appendix 2. THE ROLE OF THESIS ADVISERS IN PREPARATION OF THE ORAL COMPONENT OF THE COMPREHENSIVE EXAMINATION 20

Appendix 3. ORIGINAL RESEARCH PROPOSAL FORMAT..... 21

Appendix 4. COMPREHENSIVE EXAMINATION: FINAL REPORT 23

Appendix 5. MCB CALENDAR OF DEADLINES, PH.D. CANDIDATES..... 24

Appendix 6. TYPICAL STUDENT SCHEDULE, PH.D. CANDIDATES 25

Appendix 7A. MCB CALENDAR OF DEADLINES, THESIS MASTER'S CANDIDATES 27

Appendix 7B. MCB CALENDAR OF DEADLINES, NON-THESIS MASTER'S CANDIDATES..... 28

Appendix 8A. TYPICAL STUDENT SCHEDULE, THESIS MASTER'S CANDIDATES..... 29

Appendix 8B. TYPICAL STUDENT SCHEDULE, NON-THESIS MASTER'S CANDIDATES 30

Appendix 9. PROGRESS CHECKLIST FOR STUDENTS TRANSFERRED BY THE GRADUATE OPERATIONS COMMITTEE FROM THE PH.D. TRACK TO THE M.S. TRACK 31

Appendix 10. MCB FACULTY MEMBERSHIP AND ASSOCIATE MEMBERSHIP 32

Appendix 11. MCB COMMITTEES..... 33

Appendix 12. MCB TRAVEL GRANTS 36

Appendix 13. DISSERTATION COMMITTEE CHAIR'S REPORT 37

Appendix 14. DISSERTATION OR THESIS FINAL EXAM REPORT..... 38

Appendix 15. PROSPECTUS SIGNATURE PAGE TEMPLATE..... 39

A. ADMISSIONS

I. General

The Admissions Committee makes the final decision in accepting all applicants to the MCB Program.

Admission requires evidence that the student is capable of doing outstanding graduate work in the areas encompassed by the program. The applicant should have at least a B average in science and mathematics courses, and strong letters of recommendation and satisfactory scores on the Graduate Record Exam. It is expected that entering graduate students will have completed two semesters each of Organic Chemistry and Physics, and Mathematics through Calculus. It is desirable that entering MCB students have completed at least one semester of Genetics, and courses in Cell Biology, Developmental Biology, and Molecular Biology are also advantageous.

With the rare exception of students with minor background deficiencies (see below), it is the policy of the MCB Program and the Admissions Committee to accept only those students who meet the criteria for admission as set by the Admissions Committee. This is especially true in cases where a P.I. is willing to provide support for a particular student in the first year, thus exempting that student from laboratory rotations (see "targeted" students below). The Admissions Committee must be convinced that the "targeted student" is not a marginal admission.

II. Admission Under Special Circumstances

a. Admission of Students with Deficiencies in Formal Coursework

A student deficient in one core area but otherwise a very strong candidate, can be admitted to the program with the understanding that (s)he will make up the deficiency. A deficiency in molecular or cellular biology, for example, can be remedied by taking appropriate undergraduate courses as determined by the Graduate Operations Committee and the Admissions Committee. An example of conditions for making up a deficiency in Biochemistry follows: A student deficient in Biochemistry will take BIOCHEM 523 (as well as MOLCLBIO 641 and 642), but not BIOCHEM 623 in the first year. This arrangement will allow students deficient in a single area to make up the deficiency without falling a year behind their classmates, and becoming a liability in terms of MCB support.

b. Exemptions from Core Courses

The Admissions Committee has the authority to exempt incoming students from core courses. At the end of each spring semester, the Academic Affairs Committee will review the exemptions granted by the Admissions Committee and provide the Admissions Committee with feedback for future admissions decisions. Exemptions approved by the Admissions Committee will be upheld by the Graduate Operations Committee.

B. REQUIREMENTS FOR THE Ph.D. DEGREE

I. Courses

a. Formal Coursework

(See Appendix 5, Ph.D. Calendar of Deadlines; Appendix 6, Ph.D. Student Schedule)

Normally, all entering students take three core courses in their first year: BIOCHEM 623 - Advanced General Biochemistry, MOLCLBIO 641 - Advanced Cell Biology, and MOLCLBIO 642 - Advanced Molecular Biology.

Exemption from core courses can be granted at the time of admission by the Admissions Committee. At other times, exemptions can be granted by the Graduate Operations Committee.

In addition to the three core courses, all students must complete a minimum of 9 credits in graduate-level elective courses. To be considered an eligible elective, the course must be taught by MCB Program faculty or the student must receive permission to take the course from his/her thesis adviser and the Graduate Operations Committee. Training at such places as Woods Hole, Cold Spring Harbor, etc., can count towards one course (3 credits). Students must submit a course syllabus and proof of course completion to the MCB Office for your student file.

Students who receive a grade of C in any core course or required elective course will ordinarily be required to re-take the course and earn a grade of B or better. Grades of B- or C+ will require remedial work, to be specified in individual cases by the Graduate Operations Committee. Students must maintain an average grade of B or better for core courses and required electives (Laboratory Rotation grades are excluded from this average).

b. Laboratory Rotation

1. Purpose: Individual laboratory rotations allow the student to become acquainted with areas of current research within the program through work on specific laboratory projects and participation in other activities of the research groups. They also provide an important opportunity for the student to gain a working knowledge of techniques commonly used in contemporary research in molecular and cellular biology. In addition, rotations give faculty an opportunity to evaluate the student's performance in a research setting.

2. Description: Each first-year student participates in three laboratory rotations, the first extending from September through December, the second from December through February, and the third from February through the last day of the spring semester in May. The Director of the program must approve all arrangements made between a faculty member and a student on the basis of the student's research interests and his/her need for experience in techniques in one or more area.

To assist students in their laboratory choices, interested faculty will provide a written description of the rotation project(s) available in his/her lab, and will participate in Rotation Receptions in mid-September. In addition, the Graduate Operations Committee will meet with each new student at the beginning of the fall semester of their first year and during intercession. The student is expected to devote a minimum of 10 hours per week to the rotation project during the semester. The student should discuss more specific expectations related to their project with his/her rotation adviser at the start of the rotation.

3. Presentation of Rotation Work: At the end of the first rotation period, students will participate in a poster session at which each will present a summary of his/her rotation project to the MCB community. Following the second and third rotation periods, students will present brief (5 minute) talks to the MCB community, normally during the regular Colloquium and Seminar series.

4. Grading: Upon completion of each rotation, the faculty member will write an evaluation of the student's performance and assign a letter grade. A copy of the written evaluation will be given to the student. Rotation grades will be interpreted as follows:

A Excellent performance in majority of important areas. Shows potential to become a first-rate, independent, highly motivated and highly productive researcher. Likely to overcome any weaknesses.

A-/B+ Good performance in most areas. Shows potential to perform capable, effective, independent research.

B Adequate, but not much beyond adequate performance in most areas. Potential to become a solid but perhaps not fully independent researcher. Some weaknesses in ability or motivation.

B-/C+ Serious weaknesses in important areas. Adviser has reservations about whether candidate has potential to do Ph.D. level work.

C Serious inadequacies in important areas. Adviser believes candidate lacks potential to do Ph.D. level work.

5. Exemptions: Students entering the program with an M.S. degree, or substantial research experience, may be excused from one laboratory rotation at the discretion of the Admissions Committee or the Graduate Operations Committee. Requests for exemption, in the form of a petition by the student to the Graduate Operations Committee, should be documented as fully as possible by the inclusion of an M.S. thesis, reprints of published papers, and the like.

6. Laboratory Affiliation: Students choose a laboratory for their dissertation research upon completion of the third rotation. This selection should be made only after a thorough discussion of goals and expectations with the intended faculty adviser. All choices are subject to approval by the Program Director, who should be informed of each student's intentions in mid-April. Students are expected to provide a more in-depth (15 minute) presentation about their dissertation laboratory project to the MCB community in early September (the beginning of the students' second year).

Work in the dissertation laboratory (and financial support) begins in May. Students who are undecided by this time may carry out a fourth rotation during May and June to assist them in the selection of a suitable laboratory. But in that case, financial support during the summer must be provided by the faculty member in whose laboratory the fourth rotation is taking place. It is understood that an MCB faculty member is expected to provide support for dissertation students throughout their MCB careers, and faculty and their department heads/chairs are asked to sign a Memorandum of Understanding to this effect. Faculty members who lose funding and wish to request MCB support for a dissertation student must do so no later than one month prior to the start of the semester or summer in which funding is requested. Faculty members who wish to request a Teaching Assistantship for their student should indicate as such when appointment information is solicited.

c. Journal Clubs

All students are expected to enroll in a Journal Club each semester from their second to fifth year. Journal Clubs covering various topics in the current scientific literature are offered by the various participating departments. Students must register for Journal Clubs in at least two different scientific areas during their residency.

d. Seminars

All students are expected to attend the weekly MCB Colloquia (MOLCLBIO 691A), which feature MCB faculty, as well as Special Topics Workshops held throughout the year. Students are also expected to attend one seminar per week sponsored by the MCB Program (BIO 891-02 or MOLCLBIO 692) or the participating departments. PhD students should register for Seminar and Colloquium every semester until their fifth year.

e. Teaching Assistantship Requirement

Every MCB student is expected to have some teaching experience during his/her residency. This is usually, but not always, accomplished through a teaching assistantship in the first year. Evaluations of the student's performance as a Teaching Assistant will be made in writing to the Director by the TA's faculty supervisor and will become part of the student's file.

f. Evaluation of Student Progress in First Year

If performance was unsatisfactory during the first semester in residence, the student will be notified in February in writing that s/he is on probation, and performance standards will be specified which must be met during the second semester in order for the student to remain in the program. Students who fail to perform satisfactorily during both the first and second semesters may be dismissed from the program, with financial support being terminated in May.

When a student has made satisfactory progress in some areas and shows some promise for graduate work, but has serious deficiencies in other areas, the student may be formally transferred to the M.S. track. This action may result in a terminal M.S. degree, or the student may be invited to re-apply to the Ph.D. Program after completing substantial M.S. work. Students transferred from the Ph.D. track to the M.S. track at the end of the first year have not met the requirements for an M.S. degree (see Appendix 8).

Continuation in the program toward completion of an M.S. will normally require that the student secure the agreement of a faculty adviser willing to provide laboratory space and financial support for work on a laboratory project. Students who are unable to make such an arrangement will be dismissed from the program without completion of the M.S.

II. Evaluation of Student Progress After the First Year

Brief written evaluations of student progress are prepared each year by the dissertation adviser and submitted to the Graduate Operations Committee for review. These evaluations normally become part of the student's file, and a copy is sent to the student. Any student who wishes to examine his/her file should make an appointment at the MCB Program office to do so. However, the files may not be removed from the office.

III. Fellowship Application

In the summer of their first year, after dissertation labs are selected, MCB PhD students will prepare a proposal application on their research topic modeled after the NSF GRFP. Students will first meet with the Office of Professional Development for guidance on crafting a proposal. The purpose of the proposal development is to enable students to immerse themselves in relevant literature, to help with future success with ORP and prospectus preparation, and to familiarize students with the application process for funding from external agencies. A review panel will provide feedback about the proposals; eligible students are encouraged to submit the proposals to NSF, and ineligible students are encouraged to apply for alternative external funding. All students will be eligible for an internal award for the strongest proposal application.

IV. Comprehensive Examination

1. The comprehensive examination consists of an oral defense of an original research proposal (ORP). The research proposal must take the form of a formal written document that is approved by the Examining Committee and kept in the student's official MCB file. The oral defense of this proposal must be passed before the end of the spring semester of the second year in residence unless special permission for an extension is granted by the Curriculum Committee.

This examination is intended to test the student's ability to develop a feasible research project, to conceive scientifically valid hypotheses, to work out experimentally sound means for their proof, and to defend these

ideas in front of an examining committee. **The scientific objective of the proposal may be in the general area of the thesis research, although it may not overlap significantly with the thesis project.** The proposal must be based on original ideas and certified as such by the dissertation adviser.

The oral examination is designed to test the competence of the doctoral candidate in skills not evaluated by previous examinations. The skills to be tested include the ability to become expert in a limited area of the current research literature; to conceive an original research project; to apply newly learned tools to the investigation; to envision the possible results of planned experiments; to set criteria by which the data and results will be assessed; to establish reasonable priorities among possible approaches to the problem.

Not all research projects that are reasonable are equally suitable for this examination. For example, it may be interesting to identify all the volatile components of human blood. One could propose to use a combination of gas chromatography and mass spectrometry to do this. However, for an oral exam this topic may not provide evidence of creativity or the other attributes listed above. Borderline proposals may be given the benefit of the doubt, but in such cases the student should expect to be examined in detail on the methods to be used.

In short, the more interesting and original the central concept, the more questioning will focus on that concept. This generally provides the most satisfactory examination and the most valuable experience for the student. However, it is particularly important that the student state a clear-cut hypothesis that can be directly tested.

In starting work on a proposition, a student will usually find it most efficient to read deeply on a few limited topics rather than to read volumes of reviews hoping for an idea to strike. Good ideas usually come more readily when the current work is well understood.

2. Role of Faculty (See Appendix 2, The Role of Faculty in Preparation of the Comprehensive Examination)

The adviser's input should be limited to providing general guidelines about proposal development. Although other faculty may guide a student by asking questions, it is not appropriate to suggest ideas or provide answers outright. The faculty member, in so far as possible, should help the student find the way to prepare a proposal and not give them such direct advice as to share in the development of the idea. It is also not acceptable for any faculty member to participate in a practice examination. Instead, students should be encouraged to give presentations of their proposition to groups of other graduate students who can then advise on matters of presentation and provide practice in an oral defense. The adviser may be present at the final examination, though (s)he does not vote on the outcome. For a complete description of the role of the student's faculty adviser and any other faculty in preparation of the comprehensive examination, see Appendix 2.

3. Detailed Guidelines (See Appendix 1, Deadlines for Comprehensive Examination)

A preliminary meeting for students and advisors to review ORP guidelines will be held in the fall semester prior to the abstract submission deadline.

Step One: On the first day of class in the fourth semester of residence, the candidate will submit an abstract of the proposed research project and a statement of independence to the MCB Program office. The abstract document should start with a carefully worded title, the student's name, the date due, and the statement: "Abstract of a research proposal submitted to the Program in Molecular and Cellular Biology, University of Massachusetts, Amherst, in partial fulfillment of the requirements for the Oral Comprehensive Examination."

The abstract should begin with an introductory paragraph, which summarizes succinctly the background and relevance of the proposed research. This should be followed by a direct and lucid statement of the problem, the hypotheses to be tested, the objectives, and the experimental approaches to be employed. Not more than two thirds of the text should be devoted to background and introduction; not less than one third should be devoted to the specific experiments proposed. The abstract should be one or two pages in length and should contain about five literature references most pertinent to the problem.

In addition to the abstract, the student must provide a statement of independence, which will be a separate document that summarizes the research proposal and summarizes the research in the laboratory where the student is performing experiments. **If there is overlap between the ORP and the current research being done in the laboratory, including the work of others, the student must describe how the proposal differs.** The abstract will then be forwarded to the adviser with a request to describe the overlap between the ORP and any current research in the lab. One of the goals of the ORP exercise is for the student to identify a novel and tractable question in the field, and then to propose experiments to answer the question.

Step Two: Within two weeks following receipt of the Abstract and Statement of Independence (February 15 or September 15) the Chair of the Curriculum Committee will appoint a three-member Examining Committee; one of these three will be Chair. Members of the committee will generally be drawn from the program faculty, although non-MCB examiners may be included. A representative of the Curriculum Committee will also be appointed, if the candidate so desires. The MCB Program office will notify Examining Committee members of their appointment and distribute copies of the abstract. Within ten days of receiving the abstract, the Examining Committee Chair will notify the student, the Chair of the Curriculum Committee and the MCB Program office whether it is approved. If disapproved, the Examining Committee Chair will discuss the remedy with the student, and provide a deadline for the submission of the revised abstract.

Step Three: Prior to April 1, the candidate will arrange with the concerned individuals a satisfactory date for the examination. The date should be scheduled prior to May 15 (or December 15 in the fall semester). The candidate will report this information to the MCB Program office, which will then be distributed by memo to the committee and student's adviser.

Step Four: The candidate will prepare the formal research proposal. The ORP Committee and the Chair of the Curriculum Committee may advise the student during its preparation, but the role of the student's thesis adviser (and other faculty) is limited (see Appendix 2). There is often a dialogue between the student and the committee members, typically mediated by the chair, throughout the proposal development process. The proposal should be a carefully written document with a **maximum length** of twelve single-spaced typewritten pages, excluding references. The cover page of the Proposal should contain the title, the student's name, the date, and the statement: "A research proposal submitted to the Program in Molecular and Cellular Biology, University of Massachusetts, Amherst, in partial fulfillment of the requirements for the Oral Comprehensive Examination." The bibliography should include titles and inclusive pagination of each cited reference. Please see the template in Appendix 3 for formatting guidelines.

The MCB Program office and each member of the Examining Committee will receive from the candidate a copy of the proposal, not less than 10 calendar days before the date of the examination. Members of the Examining Committee have until 5 days before the scheduled examination to move for rejection of the proposal as submitted. To do so, the committee member contacts the chairperson of the Examining Committee. The chairperson, in consultation with all committee members, will decide what steps are necessary to proceed with the examination.

Step Five: The candidate will defend his/her research proposal before the Examining Committee. In general, the candidate will be expected to open the examination with a talk of approximately 30 minutes—illustrated with presentation slides—outlining the salient points of the proposal. During the defense the student must show that the experimental approach proposed is scientifically valid and the techniques to be employed will yield useful and interpretable information. Furthermore, (s)he must demonstrate a familiarity with the background information in the area of research, and with the scientific basis of the methodology to be employed in the proposed investigation.

The remainder of the examination will be devoted to the discussion of questions posed by individual committee members. At the conclusion of the examination the student will leave the room. The candidate's adviser will then be asked if (s)he wishes to make any comments. The adviser will then leave the room. However, both the adviser and the student should remain available to the committee as they deliberate and vote. While the

Curriculum Committee representative will not serve as an examiner, (s)he may ask occasional questions during the examination, and may advise the committee on their options and participate in the discussion after the student has left the room. The CC representative does not, however, vote on the final decision.

Step Six: Judgment of the candidate's performance will result in a grade of "Pass," "Conditional Pass," or "Fail." A conditional pass will carry pertinent stipulations for further work including deadlines for revision and re-defending, if applicable. The Chair will communicate all comments and concerns of the Examining Committee to the candidate, and transmit the decision and recommendation of the Examination Committee in writing (see Appendix 4: Comprehensive Examination: Final Report) to the Curriculum Committee. A Final Report form will be filled out by the Chair and submitted to the MCB Program office (Appendix 4).

The student will submit a copy of the final proposal to the MCB Program office.

V. Dissertation and Final Oral Examination/Dissertation Defense

a. Dissertation Committee

The Dissertation Committee must be formed before the end of the first month of the fifth semester of study (September 30). Names of 4 members (including the dissertation advisor) must be submitted to the MCB Program office and subsequently approved by the MCB Director and the Graduate School. One member must be from OUTSIDE the candidate's advisor's home department. One member may be from outside the University, but in that case a copy of his/her C.V. must be submitted to the Graduate School. The dissertation advisor will serve as the Chair of the committee.

It will be the responsibility of the Dissertation Committee to monitor the student's research and progress toward the Ph.D. degree. Meetings of the Dissertation Committee must be held at least once per year. The Dissertation Committee will meet with the student to approve the Dissertation Prospectus, and for the Data Defense (below). The Committee Chair will complete the [MCB Dissertation Committee Chair's Report](#) to communicate the results of each meeting, including specific requests made of the student (see Appendix 13). A copy of this report will be given to the student and other committee members.

b. Dissertation Prospectus/Outline

Before completion of the third year of study (by August 31 of the summer after the sixth semester) and at least seven months prior to the Final Oral Examination, the student shall submit a Dissertation Prospectus/Outline to the MCB Program office, which will be forwarded to the Graduate School. This is to be approved by his/her Dissertation Committee, as indicated by their signatures on the title page (see Appendix 15). The document should be circulated to the committee prior to the Prospectus meeting. Normally, the Prospectus is no longer than twelve single spaced pages of text, and includes sections for Background, Specific Aims, Preliminary Data, and Conclusion. Examples are available from MCB.

c. Data Defense

The Ph.D. candidate should receive approval from the dissertation committee to proceed with writing the dissertation. At least two months before the dissertation examination, students are to schedule a data defense with their committee. The successful completion of the data defense gives the student approval to write the dissertation and identifies issues to be addressed prior to the dissertation examination. The Committee Chair will complete the [MCB Dissertation Committee Chair's Report](#) to communicate the results of this meeting, including specific requests made of the student (see Appendix 13). A copy of this report will be given to the student and other committee members.

d. Dissertation and Final Oral Examination/Dissertation Defense

The format of the Ph.D. dissertation document is set by the Graduate School. It is the student's responsibility to

learn about and follow the rules governing the dissertation format.

The Final Oral Examination/Dissertation Defense will be administered by the Dissertation Committee after they have read and tentatively approved the dissertation and determined that the candidate has met all other requirements for the doctorate. The Ph.D. dissertation document should be distributed to the committee two weeks prior to the defense date. The time and place of the Defense must be publicly announced by the Graduate School so information about scheduling must be submitted to the MCB Program office at least one month in advance. It is expected the student will arrange for a time when all members of his/her dissertation committee will be present.

At the conclusion of the dissertation defense, the candidate should provide the committee with copies of the face page of the dissertation for their signatures. The candidate should also provide the committee with a filled-out copy of Dissertation or Thesis Final Exam Report (Appendix 14). It is the responsibility of the student to ensure that the committee completes the form, including notations about modifications to the dissertation that are required by the committee. All committee members must sign the report, and it is then submitted to the MCB Program Office. The Graduate School must receive formal notification from the MCB Director that the student has successfully passed an oral defense of the dissertation.

It is the student’s responsibility to fill out all necessary forms and meet all requirements set by the Graduate School for graduation. See the Graduate School Handbook and Graduate School Bulletin. For more information, contact the Graduate School at 545-0722.

VI. Period of Study

Students in the Ph.D. Program will normally be expected to complete all requirements for their degree within 5 years after admission. Only under exceptional circumstances will financial support be extended beyond 5 years, and this will normally be at the discretion and responsibility of the adviser.

VI. Summary of Required Coursework and Milestone Requirements for the Ph.D. Degree

a. Courses/Credits

1. Core Courses:

BIOCHEM 623 - Advanced General Biochemistry	4 credits
MOLCLBIO 641 - Advanced Cell Biology	4 credits
MOLCLBIO 642 - Advanced Molecular Biology	4 credits

2. Laboratory Rotations:

MOLCLBIO 696 - Independent Study	8 credits (3/2/3 credits for three rotations)
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3. Advanced Courses:

A minimum of 3 graduate-level elective courses	9+ credits total
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4. Journal Clubs (exempt first year)..... 1-2 credits per semester

5. MCB Departmental Seminars 1 per week minimum

6. MCB Colloquia 1 per week

7. MOLCLBIO 899 - PhD Dissertation 18 credits minimum
(maximum of 9 dissertation credits per semester)

b. Fellowship Application**c. Original Research Proposal/Comprehensive Examination****d. Prospectus****e. Data Defense****f. Dissertation and Final Examination**

Total credits, including MCB Seminar and MCB Colloquia 73 (minimum)

The Graduate School requires no minimum number of credits for a doctoral program, with the exception of dissertation credits. The MCB Program requires a minimum of 18 credits of MOLCLBIO 899 (and the maximum number of dissertation credits allowed per semester is 9). A student can ordinarily register for a maximum of sixteen (16) credits total per semester, but can receive departmental approval to exceed the total credit per semester maximum.

C. REQUIREMENTS FOR THE FAST-TRACK THESIS MASTER'S DEGREE

This program is available to BS graduates from UMass, Amherst or any other of the Five Colleges. This accelerated program is possible for students who have already begun undergraduate research in the lab of an MCB faculty member, where they will complete their Master's degree.

Please note that students applying for admission under this rubric are exempt from the GRE general exams.

Transfer of Undergraduate Credits to Graduate Transcript

Students planning to apply graduate-level course credits taken as an undergraduate (up to 6 credits which were not applied toward your undergraduate degree) should request having them transferred to your graduate transcript. The Graduate School's statute of limitations is normally three years for credit transfers. However, the MCB Program can request a waiver of this rule on the student's behalf (e.g. if the course content has not changed substantially). The request must be submitted in writing to the Graduate School. It is recommended that you take steps to make the transfer on entry into the MCB Program. Please review the Graduate School's Transfer Credit Policy for more information and the relevant form.

I. Courses

a. Formal Coursework

(See Appendix 7A, Thesis Calendar of Deadlines; Appendix 8A, Student Schedule)

University requirements for the Master's degree include a minimum of 30 credits. The MCB Program requires that candidates for the M.S. thesis degree take two of the three core courses required of doctoral students, and receive a grade of B or better. MOLCLBIO 642 must be one of these courses. In consultation with his/her adviser, the student will also take either MOLCLBIO 641 or BIOCHEM 623. Note that a graduate-level course taken as an undergraduate can be used toward the M.S. degree, if not used toward their B.S.

b. Journal Clubs

Participation in a Journal Club is mandatory every semester.

c. Seminars

Attendance and registration are mandatory every semester for the MCB Seminar Series (MOLCLBIO 692A/BIOLOGY 891A-02) or the seminar series sponsored by the department in which the student's research laboratory is located.

d. Colloquium

Attendance and registration are mandatory at the MCB Colloquium every semester (MOLCLBIO 691A).

II. Thesis and Final Oral Examination/Thesis Defense

a. Thesis Committee

The student's Thesis Committee will consist of the student's advisor as Chair, and two other MCB faculty members. The deadline for the appointment of the thesis committee is September 30 of the student's first year, at which time the student is to submit committee membership to the MCB Program office for approval by the Graduate Program Director and Graduate School.

It will be the responsibility of this committee to monitor the student's progress toward the thesis M.S. degree.

b. Thesis Outline

A preliminary description (outline) of the thesis must be approved by the committee before January 31 of the student's first year. The thesis outline must be formally submitted to the MCB Program office (to be forwarded to the Graduate School), with a title page signed by each member of the thesis committee.

c. Thesis and Final Oral Examination/Thesis Defense

The format of the M.S. thesis document is set by the Graduate School. It is the student's responsibility to learn about and follow the rules governing the thesis format. The Final Oral Examination/Thesis Defense will be administered by the Thesis Committee after they have read and tentatively approved the thesis, and determined that all other requirements for the Thesis M.S. Degree have been met by the candidate.

At the conclusion of the thesis defense, the candidate should provide the committee with copies of the face page of the thesis for their signatures. The candidate should also provide the committee with a filled-out copy of Dissertation or Thesis Final Exam Report (Appendix 14). It is the responsibility of the student to ensure that the committee completes the form, including notations about modifications to the thesis that are required by the committee. All committee members must sign the report.

The Graduate School must receive formal notification from the MCB Director that the student has successfully passed an oral defense of the thesis, but it is not required that the defense be announced or presented to the public. The final written thesis, with a signature page signed by every member of the Thesis Committee and the Graduate Program Director, must be submitted to the Graduate School.

It is the student's responsibility to fill out all necessary forms and meet all requirements set by the Graduate School for graduation. See the Graduate School Handbook and Graduate School Bulletin. For more information, contact the Graduate School at 545-0722.

III. Credits

It is a Graduate School requirement for the Master's degree that the student take a minimum of 30 credits of graduate-level courses. At least one-half of the total required credits must be on a letter-graded basis. The student does not register for MOLCLBIO 698 (Master's Project), but can count 10 credits of MOLCLBIO 699 (Master's Thesis) toward the degree.

IV. Summary of Requirements for the Thesis Master's Degree

a. Courses

(must have a total of 30 graduate-level credits)

1. Core Courses:

- MOLCLBIO 642 - Advanced Molecular Biology..... 4 credits and one of the following
- BIOCHEM 623 - Advanced General Biochemistry 4 credits or
- MOLCLBIO 641 - Advanced Cell Biology 4 credits

- 2. Independent Study: MOLCLBIO 696 (Lab Research) 6 credits (3 credits per semester)
- 3. Journal Clubs 2-4 credits (Journal Clubs carry 1 or 2 credits)
- 4. MCB Seminar 2 credits (1 per week minimum)
- 5. MCB Colloquium 2 credits
- 6. Master's Thesis (MOLCLBIO 699):..... 10 credits

TOTAL 30-32 Credits*

* Note that since only 14 credits in the above program are letter-graded (core courses and MOLCLBIO 696), the student must have at least one other credit in a letter-graded course or journal club.

b. Master's Outline

c. Master's Thesis and Defense

Students must enroll in Master's Thesis (MOLCLBIO 699) while working on their thesis. Details of the thesis committee, thesis document and thesis defense are outlined above.

D. STUDENT TRANSFERRED FROM THE PH.D. TRACK TO M.S. TRACK

(Also see Appendix 9)

In addition to the "Fast-Track Master's Degree" (see Section C, p. 13) there are two other Master's degree options offered through the MCB Program for Ph.D. candidates who wish to switch to a Master's:

- (I) M.S. option for students who have not passed the original research proposal/comprehensive exam
- (II) M.S. option for students who wish to switch to a M.S. after passing the original research proposal/comprehensive exam

I. Procedure and Requirements for Students who have not passed the Original Research Proposal

In the case of transfer to the M.S. track at the end of the first year and before the original research proposal, action is taken formally through the Graduate School for the student to transfer to the M.S. Thesis track. A Committee is appointed consisting of the student's adviser (Committee Chair), plus two other MCB faculty members subject to the Graduate Program Director's approval. The Adviser is responsible to see that the student's committee is appointed no later than September 15 of the student's second year. Defense of the M.S. Thesis or Research Report must take place before May 31 of the following year. It is a Graduate School requirement for the Master's degree that the student take a minimum of 30 credits of graduate-level courses. A minimum of 15 credits must be on a letter-graded basis.

The Graduate School requires the student take 6 credits of MOLCLBIO 699 (Master's Thesis). The student may count up to 10 credits of MOLCLBIO 699 toward the degree.

A thesis outline is formally submitted to the MCB Program office (to be forwarded to the Graduate School), with a title page signed by each member of the committee. The Graduate School must receive the outline four months prior to the thesis defense. Exemption from this timing requirement is possible if requested by the student's adviser. The format of the M.S. Thesis is set by the Graduate School and it is the student's responsibility to learn about and follow the rules governing the thesis format.

The Final Oral Examination/Thesis Defense will be administered by the Thesis Committee after they have read and tentatively approved the thesis, and determined that all other requirements for the Thesis M.S. Degree have been met by the candidate. It is not required that the thesis defense be announced publicly, i.e. In the Loop, nor is the student required to present a public seminar.

The Graduate School must receive formal notification from the MCB Director that the student has successfully passed the thesis defense. The final written thesis, with a signature page signed by every member of the Thesis Committee and the Graduate Program Director, must be submitted to the Graduate School.

II. Procedure and Requirements for Students who have passed the Original Research Proposal

In the case of transfer to the M.S. track for PhD students who have already passed the original research proposal, procedures are the same as in Section I except that the student's committee may accept passing the original research proposal (i.e. a written proposal and successful defense of the proposal) for the 'project defended before a committee' part of the requirements. The student must also write a report of their research, which must be approved by their adviser and the MCB Director. A copy of the final report, with a title page signed by the student's advisor and Graduate Program Director, will be filed in the MCB Program office. The degree awarded will be a Non-Thesis Master's Degree. The student registers for MOLCLBIO 698 (Masters Project) credits instead of MOLCLBIO 699 (Master's Thesis).

III. Evaluation of Candidate for Readmission to the Ph.D. Track

Evaluation of students in the M.S. track who are seeking readmission to the Ph.D. track should take place no later than the sixth semester in residence (the statute of limitations for M.S. students). The Thesis Committee will evaluate the candidate on the basis of (1) the quality and quantity of research accomplished, and (2) the student's ability and suitability for continuing in the Ph.D. program. Note: if the evaluation takes place in the fifth semester, students readmitted to the Ph.D. track will be able to complete the oral examination at the end of their sixth semester in the program.

The Thesis Committee will recommend, in writing, to the Graduate Operations Committee that either:

a) The student be terminated from the Program. In this case, the committee must decide whether the thesis document should be modified to a format acceptable to the Graduate School or whether it can be submitted in its present format for the M.S. degree. Any current financial support from the Program for the student will terminate no later than 60 days after this recommendation.

OR

b) The student be invited to apply for readmission to the Ph.D. track. In this case a research report is sufficient (see below).

IV. Application for Readmission to the Ph.D. Track

Formal application for admission must be made through the Graduate School. The student's entire record will be considered by the MCB Admissions Committee by the end of the student's sixth semester in the MCB Program. If readmitted, the student will submit an abstract of the proposal for the Original Research Proposal no later than September 1 of that year. The committee for that examination will be appointed by September 15, and the examination will be completed no later than December 15 (see Appendix 1, Deadlines for Original Research Proposal). Some flexibility in these deadlines may be appropriate if approved by the Graduate Operations Committee.

PLEASE SEE SECTION C.IV AND APPENDIX 8A AND 8B FOR THESIS AND NON-THESIS SUMMARY OF REQUIREMENTS FOR MASTER'S DEGREE

It is the student's responsibility to fill out all necessary forms and meet all requirements set by the Graduate School for graduation. See the Graduate School Handbook and Graduate School Bulletin. For more information, contact the Graduate School at 545-0722.

E. STUDENTS TRANSFERRING FROM FAST-TRACK M.S. TO PH.D. TRACK

All students who wish to switch from the Fast Track M.S. to the Ph.D. track must formally apply to the MCB Ph.D. program via the Graduate School. The student's entire record will be considered by the MCB Admissions Committee. If the student is accepted into the Ph.D. Program applicable course-work credits already taken as part of the M.S. requirements will be transferred towards the Ph.D. Typically students will have taken, or be in the process of taking, two of the three MCB core courses (MOLCLBIO 642 plus either MOLCLBIO 641 or BIOCHEM 623) during the first year of the M.S. degree program. They will be required to take the third core course at the first opportunity it is offered after admission to the Ph.D. program. Students transferring from the Fast Track M.S. to the Ph.D. track will be required to satisfy all the requirements for the Ph.D. degree (Section B) and will be required to satisfy the teaching requirement.

Procedure and requirements for transfer during the second year of the M.S.

Students who are accepted into the Ph.D. Program during their second year as a M.S. candidate will be required to take the third core course at the earliest opportunity. They will take the oral original research proposal exam during the first Spring semester after they have transferred into the Ph.D. Program.

**Appendix 1. DEADLINES FOR ORIGINAL RESEARCH PROPOSAL/
COMPREHENSIVE EXAM***

	SPRING TERM	FALL TERM
Preliminary meeting with students and faculty	Fall semester	As needed
Abstract of Original Research Proposal and Statement of Independence submitted to MCB program office	Spring semester, first day of classes	Fall semester, first day of classes
Examining Committee appointed and abstract distributed	Within two weeks of the first day of classes	Within two weeks of the first day of classes
Examining Committee Chair will notify the student if the abstract is approved	Within ten days of receiving the abstract	Within ten days of receiving the abstract
Date of comprehensive examination (ORP defense) scheduled. The proposal must be circulated at least ten days prior to the examination and cannot be rejected after the <u>fifth day</u> preceding the examination	April 1	November 1
Last possible date to defend ORP	May 15	December 15

*Failure to observe these deadlines is a cause for dismissal from the Program. All extensions must be approved in advance of the stated deadline by the Chair of the Curriculum Committee.

Appendix 2. THE ROLE OF THESIS ADVISERS IN PREPARATION OF THE ORAL COMPONENT OF THE COMPREHENSIVE EXAMINATION

It has become apparent that faculty advisers have had widely differing degrees of involvement with their Ph.D. students during the preparation of research proposals, and especially during the preparation for the defense of the research proposal. Such a situation is completely unfair to the student body and has arisen because some faculty members consider the examination primarily a learning experience while others consider it an important criterion for judging the ability of students to deal with the real world of research.

This problem was discussed at a general faculty meeting in December 1988. A consensus was reached that the faculty member may provide limited assistance to the student in preparing the abstract or the proposal; however, (s)he may not prepare the student for the examination, though (s)he should provide the student with general guidelines. For example, it is desirable that the thesis advisers should tell the student to be prepared to defend the use of any technique proposed and be able to explain both the practical and theoretical basis of the technique and the technique's potential limitations. On the other hand, it is completely unacceptable to tell the student that the proposed technique is not good and to suggest a different one.

It is not acceptable for a faculty member to participate in a practice examination. Instead, students should be encouraged to give presentations of their proposition to groups of other graduate students who can then advise on matters of presentation and provide practice in an oral defense.

Faculty advisers could help the students considerably by discussing the preparation of a research proposal in general terms. It is acceptable to show a student a copy of a grant proposal, for example, and to explain the reasons for the way the different sections are written; it could be very helpful to the student to see referees' comments as well.

Students are encouraged to get information from other faculty members, postdocs, and students concerning any aspect of the proposed research. Examples are leads into the literature, techniques that may or may not be published, new information from "the grapevine," etc. Both students and faculty members should be concerned about the need to ensure that the concept of the proposal and its basic strategy are the work of the student. (This is a difficult area and when questions arise it is important to consult with a member of the Curriculum Committee. This consultation will help ensure that similar standards are applied across the Program.) Example: A student proposes a procedure that the faculty member recognizes as okay in principle, but impractical or terribly out-of-date (inefficient).

It is reasonable to question the method, suggesting further reading, which will enable the student to learn why the method is not good one. The key element is that the faculty member, in so far as possible, should help the student find the way to prepare a proposal and not give them such direct advice as to share in the development of the idea.

Often, a faculty member can help a student avoid a pitfall by asking, "Have you considered other ways to analyze for the phenomenon—ways that might be more direct (less time-consuming, cheaper)?"

Other questions that often need to be asked include, "Isn't this experiment already implied in the previous papers? Won't those authors certainly be doing this work?" Or, "Is this problem anywhere near the mainstream of research? Will the results be worth the time?"

When a student asks his/her adviser questions that might violate the guidelines, it is appropriate for the adviser to refer the student to a member of the Curriculum Committee. This will preclude any problems involving conflict of interest.

In contrast to the oral comprehensive examination, the preparation of posters and talks on their rotation projects by first-year students is an area where faculty input is decidedly appropriate. This is a situation in which students can learn a great deal from their advisers.

Appendix 3. ORIGINAL RESEARCH PROPOSAL FORMAT

SPECIFIC AIMS (1 PAGE)

Opening paragraph or two.

The central hypothesis will be tested with XXX specific aims:

Aim 1: To determine....

Aim 2: To characterize.....

RESEARCH STRATEGY

(1 PAGE FOR SIGNIFICANCE AND INNOVATION)

Significance. ~0.5 – 0.66 page

Innovation. ~0.33 – 0.5 page

Approach (Up to 10 pages for Approach)

Specific Aim 1: To determine XXX

Introduction.

Justification & Feasibility.

Research Design. (Variable number of sub-aims labeled Study1.X – see below)

Study 1.1: To define XXX.

Study 1.2: To examine XXX

Study 1.3: To measure XXX

Study 1.4: To study how XXX

Expected Outcomes.

Potential Problems & Alternative Strategies.

Specific Aim 2: To characterize XXX

Introduction.

Justification & Feasibility.

Research Design.

Study 2.1: To XXX

Study 2.2: To XXX

Study 2.3: To XXX

Expected Outcomes.

Potential Problems & Alternative Strategies.

BIBLIOGRAPHY

Appendix 4. COMPREHENSIVE EXAMINATION: FINAL REPORT

Candidate:

Adviser:

Examining Committee

1.

2.

3.

Defense

Date:

Time:

Place:

Judgment of the Examining Committee: PASS FAILURE CONDITIONAL PASS:
 Rewrite required
and/or
 Re-defense required

Conditions (**please include deadlines for revision and re-defending**):

Signatures of the Committee Members:

1.

2.

3.

Appendix 5. MCB CALENDAR OF DEADLINES, PH.D. CANDIDATES

First Year:

Mid-September – Mid-December: First Laboratory Rotation

December: Presentation of First Rotation Poster

Mid-December – Mid-February: Second Laboratory Rotation

February: Presentation of Second Rotation Talk

Mid-February – Mid-May: Third Laboratory Rotation

Mid-April: Choice of dissertation laboratory reported to MCB Director

May: Presentation of Third Rotation Poster

Late May (last day of Teaching Assistantship appointment): Work begins in dissertation laboratory

Summer: Meet with OPD and begin preparing Fellowship Application

Second Year:

Early September: Dissertation Laboratory oral presentation

October: Submit Fellowship Application

Fall: Meet about ORP

Spring Semester First Day of Classes: Abstract and Statement of Independence for Original Research Proposal submitted to MCB Office

February: ORP committee appointed, and student notified within the following 10 days as to whether abstract is approved

April 1: Date of examination scheduled

Not less than 10 days prior to scheduled date of exam: written proposal is distributed to committee

Less than 5 days prior to scheduled date of exam: written proposal can no longer be rejected

May 15: Last possible date to defend Original Research Proposal; ORP Final Report signed by committee members and submitted to MCB Program office along with one copy of Proposal in final form; Results of ORP/Advancement to Candidacy reported to Graduate School by MCB Program office

Third Year:

September 30: Dissertation Committee (4 members, including P.I. of dissertation laboratory as Chair and at least one outside member) approved by MCB Director and submitted to Graduate School

August 31 (end of summer after 3rd year): Dissertation Prospectus formally approved by Dissertation Committee. Copy with original signatures of Committee and Graduate Program Director is submitted to MCB Office (to be forwarded to the Graduate School). Graduate School requires submission at least 7 months prior to the Final Oral Examination.

Fourth and Fifth Years:

Data Defense two months prior to final defense

MCB Office notified of final defense date, time, location and title one month prior to final defense.

Final defense seminar on dissertation work presented.

Observe Graduate School deadlines for final submissions required to complete formal degree. Ph.D. normally completed within FIVE YEARS from date of matriculation in MCB Program.

GRADUATION DEADLINES

All requirements for any advanced degrees to be awarded at a given degree-granting period must be completed by the appropriate deadline, as per the Graduate School. It is the student's responsibility to fill out all necessary forms and meet all requirements set by the Graduate School for graduation. See the Graduate School Handbook and Graduate School Bulletin. For more information, contact the Graduate School at 545-0722.

Appendix 6. TYPICAL STUDENT SCHEDULE, PH.D. CANDIDATES

First Year:

FALL

MOLCLBIO 642 - Advanced Molecular Biology	4 credits
MOLCLBIO 696 - Independent Study (Lab Rotation)	3 credits
BIOLOGY 891A SECTION 02 - MCB Seminar.....	1 credit
MOLCLBIO 691A - MCB Colloquium	1 credit
Teaching Assistantship (pg 7)	no credits
No Journal Club (pg 6).....	no credits

SPRING

MOLCLBIO 641 - Advanced Cellular Biology	4 credits
BIOCHEM 623 - Advanced General Biochemistry.....	4 credits
MOLCLBIO 696 - Independent Study (Lab Rotation)	5 credits (split into 2/3)
MOLCLBIO 692 - MCB Seminar.....	1 credit
MOLCLBIO 691A - MCB Colloquium	1 credit
Teaching Assistantship (pg 7)	no credits
No Journal Club (pg 6).....	no credits
Selection of Dissertation Laboratory - start May (pg 6)	

SUMMER

Meet with OPD and begin preparing Fellowship Application

Second Year:

FALL

BIOLOGY 891A - MCB Seminar	1 credit
MOLCLBIO 691A - MCB Colloquium	1 credit
Journal Club	1 credit
Elective course (pg 5).....	3 credits
Submit Fellowship Application (October)	
Student/Advisor Meeting about Original Research Proposal	
Preparation of Abstract for Original Research Proposal - due first day of spring classes (pg 8)	

SPRING

MOLCLBIO 692 - MCB Seminar.....	1 credit
MOLCLBIO 691A - MCB Colloquium	1 credit
Journal Club	1-2 credits
Elective course (pg 5).....	3 credits
Complete Comprehensive Examination - prepare proposal and defend (pg 8)	

Third Year and beyond:

- A minimum of 9 credits total in graduate-level elective courses (pg 5)
- Dissertation Committee appointed by September 30, at beginning of 3rd year. Meets at least annually (pg 10)
- Dissertation Prospectus submitted by August 31, at end of 3rd year (pg 10)
- Data defense completed at least two months prior to final defense (pg 10)
- MOLCLBIO 899 - Dissertation Research (1-9 credits per semester); 18 credits total required

BIOLOGY 891A SECTION 02/MOLCLBIO 692 - MCB Seminar; continued until 5th year (pg 5)

MOLCLBIO 691A - MCB Colloquium; continued until 5th year (pg 5)

Journal Club; continued until 5th year (pg 5)

Students are eligible for Continuous Enrollment (an alternate form of registration), after passing the Original Research Proposal/Comprehensive Exam during any semester when taking NO courses for formal credit. Students should NOT register for this, unless they expect to finish their degree work before the end of the spring semester. Refer to the Graduate Student Handbook for more information about registering for Continuous Enrollment.

Appendix 7A. MCB CALENDAR OF DEADLINES, THESIS MASTER'S CANDIDATES

First Year:

September 30: Thesis Committee (3 members, including adviser as Chair) submitted to MCB program office (pg 13)

January 31: Thesis Outline approved by committee and MCB Program Director. Submitted to MCB program office (to be forwarded to the Graduate School) four months prior to oral exam/defense (pg 13)

Final Oral Examination/Thesis Defense: Final Exam Report and signature page submitted to MCB office; final written thesis submitted to Graduate School (pg 13)

GRADUATION DEADLINES

All requirements for any advanced degrees to be awarded at a given degree-granting period must be completed by the appropriate deadline, as per the Graduate School. It is the student's responsibility to fill out all necessary forms and meet all requirements set by the Graduate School for graduation. See the Graduate School Handbook and Graduate School Bulletin. For more information, contact the Graduate School at 545-0722.

Appendix 7B. MCB CALENDAR OF DEADLINES, NON-THESIS MASTER'S CANDIDATES

First Year:

End of first year: Transfer to M.S. track

Second Year:

September 15: Committee (3 members, including adviser as Chair) submitted to MCB Program office

January 31: Research Project Outline approved by committee and submitted to MCB Program office

May 31: Final date to defend M.S. Research Project and submit Final Exam Report and document signed by committee members and Graduate Program Director to MCB Program office

GRADUATION DEADLINES

All requirements for any advanced degrees to be awarded at a given degree-granting period must be completed by the appropriate deadline, as per the Graduate School. It is the student's responsibility to fill out all necessary forms and meet all requirements set by the Graduate School for graduation. See the Graduate School Handbook and Graduate School Bulletin. For more information, contact the Graduate School at 545-0722.

Appendix 8A. TYPICAL STUDENT SCHEDULE, THESIS MASTER'S CANDIDATES

(University requirements for the Master's degree include a minimum of 30 credits and at least ½ of credits counted towards graduation must be letter graded)

FALL

MOLCLBIO 642 - Advanced Molecular Biology	4 credits
MOLCLBIO 696 - Independent Study (Lab Rotation)	3 credits
BIOLOGY 891A SECTION 02 - MCB Seminar.....	1 credit
MOLCLBIO 691A - MCB Colloquium	1 credit
Journal Club (pg 13).....	1-2 credits
MOLCLBIO 699 - Master's Thesis.....	5 credits

SPRING

MOLCLBIO 641 - Advanced Cell Biology	4 credits OR
BIOCHEM 623 - Advanced General Biochemistry.....	4 credits
MOLCLBIO 696 - Independent Study (Lab Rotation)	3 credits
MOLCLBIO 692 - MCB Seminar.....	1 credit
MOLCLBIO 691A - MCB Colloquium	1 credit
Journal Club (pg 13).....	1-2 credits
MOLCLBIO 699 - Master's Thesis	5 credits

(16 credit maximum per semester for graduate students before needing special permission)

Appendix 8B. TYPICAL STUDENT SCHEDULE, NON-THESIS MASTER'S CANDIDATES

(University requirements for the Master's degree include a minimum of 30 credits)

FALL

MOLCLBIO 642 - Advanced Molecular Biology	4 credits
MOLCLBIO 696 - Independent Study (Lab Rotation)	3 credits
BIOLOGY 891A SECTION 02 - MCB Seminar.....	1 credit
MOLCLBIO 691A - MCB Colloquium	1 credit
Journal Club (pg 13).....	1-2 credits
MOLCLBIO 698 - Master's Project.....	3 credits

SPRING

MOLCLBIO 641 - Advanced Cell Biology	4 credits OR
BIOCHEM 623 - Advanced General Biochemistry.....	4 credits
MOLCLBIO 696 - Independent Study (Lab Rotation)	3 credits
MOLCLBIO 692 - MCB Seminar.....	1 credit
MOLCLBIO 691A - MCB Colloquium	1 credit
Journal Club (pg 13).....	1-2 credits
MOLCLBIO 698 - Master's Project.....	3 credits

(16 credit maximum per semester for graduate students before needing special permission)

Appendix 9. PROGRESS CHECKLIST FOR STUDENTS TRANSFERRED BY THE GRADUATE OPERATIONS COMMITTEE FROM THE PH.D. TRACK TO THE M.S. TRACK

Student Name:

Date Transferred:

Thesis Adviser:

Requirements for readmission to Ph.D. track:

1. Graduate Level Course(s):

Course and Instructor	Semester and Grade	GOC Approval

2. M.S. Thesis:

A. Date Committee Appointed:

B. Committee Membership and Department Affiliations:

C. Thesis Committee Recommendation:

Terminate student with M.S.

Student should apply for readmission to Ph.D. Program

3. Other Requirements:

4. Decision of Admission Committee:

Appendix 10. MCB FACULTY MEMBERSHIP AND ASSOCIATE MEMBERSHIP

There are two categories of MCB faculty membership as follows:

Members may teach MCB core courses, serve on MCB thesis/dissertation committees, and chair MCB thesis/dissertation committees. (Corresponds to Graduate Faculty Status "G".) In addition, Members will elect the Steering Committee from among their own ranks according to the distribution specified in the Academic Requirements, Policies and Procedures of the MCB Program (page 37).

Associate Members may teach graduate courses appropriate for MCB students and serve on MCB thesis/dissertation committees, but cannot chair MCB thesis/dissertation committees. (Corresponds to Graduate Faculty Status "M".)

Rights and Responsibilities

Members and Associate Members alike are invited to participate in all MCB-sponsored functions such as the colloquia, workshops, seminars and the MCB Retreat.

Members will in general direct an independent research laboratory with adequate financial support, have a record of graduate training in areas pertinent to the mission of the MCB Program, and provide evidence of appropriate publications in their specialty field. Members who accept dissertation students into their laboratories are expected to support the students until graduation. Should the Member lose funding, requests for MCB student support must be made to the Director at least one month prior to the start of the semester or summer in which support is requested. Members also assume the responsibility to contribute to the training mission of the MCB Program through (1) substantial teaching efforts in a course or courses intended primarily for MCB graduate students, (2) service on MCB committees such as Steering, Graduate Operations, Curriculum, Recruiting, Admissions, Seminar or (3) direction of MCB Master's or Doctoral research. To remain in good standing, Members must serve in one of these capacities at least once every three years.

Members are also expected to take part in written and oral examinations, serve on thesis and dissertation committees, and participate in the MCB Colloquia and the MCB Retreat. Associate Members may share in these responsibilities if they so wish.

Selection and Appointment

New faculty will be evaluated for Membership/Associate Membership on the basis of the appropriateness of their research field, their postdoctoral productivity, their promise for obtaining extramural grant support, and their commitment to participation in the activities of the MCB Program. Members and Associate Members will be appointed to initial one-year terms by the Graduate Program Director in consultation with the Steering Committee. At the conclusion of the initial appointment term the Director and Steering Committee will review the member's contributions to the MCB Program and the Director may reappoint the member for a five-year term. Subsequent reappointments to the MCB Program will be for five-year terms if the Member has demonstrated contributions to the Program as outlined under Rights and Responsibilities. The MCB Steering Committee will review all such reappointments and recommend appropriate action to the Director.

Appendix 11. MCB COMMITTEES

The following descriptions are provided so that MCB faculty and students will be able to direct questions and requests appropriately. Appointments to committees are as follows:

- Graduate Operations Committee: Requested to serve by MCB Director
- Admissions Committee: Requested to serve by MCB Director
- Curriculum Committee: Requested to serve by MCB Director
- Program/Seminar Committee: Requested to serve by MCB Director
- Recruiting/Retreat Committee: Requested to serve by MCB Director
- Steering Committee: Elected by MCB Faculty, 3-year terms

Procedures:

The MCB Director sends a questionnaire in the spring requesting that faculty indicate preference of committee service for the coming year.

Attempts are made to compose and rotate membership so that every committee is composed of both old and new members. Ordinarily, the committee Chair is appointed by the Director and will have previously served as a member of the committee.

GRADUATE OPERATIONS COMMITTEE

1. A minimum of two faculty members requested to serve by Director.
2. Responsibilities:
 - a. Oversee day-to-day academic issues concerning MCB students.
 - b. Make decisions about special requests concerning exemptions from Program academic requirements.
 - c. Meet with first-year students at the start of their first and second academic semesters.
 - d. Meet with appropriate MCB faculty members about first year performance and report academic status to students in the context of their overall performance.
 - e. Evaluate, in the context of the overall record, the progress of any student who fails the comprehensive examination/original research proposal; make decision about the student's future in the MCB Program.
 - f. Nominate selected students for Graduate School Fellowships.
 - g. Nominate students for fellowships from sources outside the University.
 - h. Work with MCB office staff to ensure deadlines are met and records kept current.

ADMISSIONS COMMITTEE

1. Four or five faculty members, requested to serve by Director.
2. Responsibilities:
 - a. Evaluation of student applications for admission.
 - b. Interviews and correspondence with applicants.

- c. Nominate selected entering students for Graduate School Fellowships in consultation with the Graduate Operations Committee.
- d. Determine exemptions and special requirements for students entering with non-standard academic backgrounds.
- e. Work with MCB office staff to ensure prospective student correspondence and records are kept current.

CURRICULUM COMMITTEE

1. Four or more faculty members requested to serve by the Director.
2. Responsibilities:
 - a. Evaluate MCB core courses and curriculum for content and effectiveness.
 - b. Initiate discussion about new MCB course offerings or advanced electives that would be appropriate for MCB students.
 - c. Oversee arrangements for original research proposals/comprehensive examinations.

PROGRAM/SEMINAR COMMITTEE

1. One or two faculty members requested to serve by Director; one student volunteer.
2. Responsibilities:
 - a. Plan seminars in consultation with the Director.
 - b. Solicit names of seminar speakers from the MCB Program membership.
 - c. Provide guidance to the MCB office staff for implementing seminar arrangements.

RECRUITING/RETREAT COMMITTEE

1. Three or more faculty members representing the broad research interests within the MCB Program; two or more student representatives as determined by the Director.
2. Responsibilities:
 - a. Oversee production of information and publicity materials for the MCB Program (posters, brochures).
 - b. Oversee design and updates of the MCB web site.
 - c. Plan recruiting and retreat events and coordinate recruiting efforts.
 - d. Provide input to the MCB Director for other ways to enhance recruitment to the MCB Program.

STEERING COMMITTEE

1. Eight faculty members elected by MCB faculty for 3-year terms; one student representative as determined by the Director (usually the student President selected by the MCB graduate student organization). MCB Director is Chair, ex officio. Area representation observed in makeup of Committee as follows:
 - 2 members from Biochemistry & Molecular Biology
 - 2 members from Biology
 - 1 member from Chemistry

- 1 member from Veterinary & Animal Sciences
- 1 member from the Five Colleges (i.e. Amherst, Mt. Holyoke or Smith)
- 1 member at large from any department with at least one MCB Member
- 1 student member as determined by MCB graduate student organization and Graduate Program Director

2. Responsibilities:

- a. Policy decisions.
- b. Budgeting decisions.
- c. Election of new MCB faculty.
- d. Liaison with other MCB committees.
- e. Decide level of graduate student stipends.
- f. Guide future direction of MCB Program.
- g. Review nominations and select nominees for MCB student fellowship applications.
- h. Review nominees and select Byron Prize winner.

Appendix 12. MCB TRAVEL GRANTS

Purpose: There is no better way to learn about a discipline and to begin building professional networks than to attend professional conferences and workshops. The purpose of the student travel program is to encourage students to attend these events by providing funds to supplement their cost.

Eligibility:

- All PhD students in the MCB, NSB, OEB, and PB programs, who are in good academic standing are eligible to receive supplemental funds to attend conferences and workshops once each year, up to a lifetime limit of \$2,500.
- Starting in their 3rd year, students must be presenting their research in order to receive travel funds for a conference or workshop.
- The annual limits on travel funds are:
 - Before completing the Prospectus \$450
 - After completing the Prospectus \$800

Procedures:

1. Application for the travel grant must be made at least 2 weeks IN ADVANCE of the meeting.
2. Request for a travel award is made by filling out the Pre-Travel Authorization Form through the Travel Registry.
3. The Pre-Travel Authorization Form must be submitted to the IDGP Program office with the student's advisor/PI approval. Final authorization of the travel award will be made by the IDGP Director (Fund Administrator). Complete instructions for the online approval can be found on the Program website.
4. After the trip, all receipts for reimbursement must be submitted to the IDGP office.
5. If booking airfare, hotel etc. in advance, students may use the departmental travel card prior to the trip. This is intended to minimize out of pocket payments for students and the length of time a student has to wait to be reimbursed. If using the departmental travel card, the total amount of the payment must be less than or equal to the award. If the payment put on the travel card is less than the annual trip allotment, the student may additionally bring receipts to the IDGP office after the trip for reimbursement up to the total award amount.
6. **Split-funded trips:** In the case of funding from both IDGP and another source, the student must be sure both sources know the travel will be split-funded, and must provide the authorized funding information (speedtype, PI and authorized amount) to the travel reimbursement processor.

Appendix 13. DISSERTATION COMMITTEE CHAIR'S REPORT

It will be the responsibility of the Dissertation Committee to monitor the student's research and progress toward the Ph.D. degree. Meetings of the Dissertation Committee must be held at least once a year. The Committee Chair will complete the online version of this form (<https://gpls.cns.umass.edu/mcb/students/committee-meeting-form>) to convey the results of each meeting to the MCB Program office, including specific requests made of the student. A COPY OF THIS REPORT WILL BE GIVEN TO THE STUDENT.

Student's Name:

Committee Chair's Name:

Committee Members' Names:

Date of Meeting:

Purpose of Meeting (annual meeting, prospectus, data defense, etc):

Schedule of progress

Please indicate whether progress is generally on schedule, or behind or ahead of schedule.

Command of project

Did the candidate show good command of the presentation and the project, or did the candidate too often allow the advisor to answer questions and lead the discussion?

Benchmarks for next meeting

Benchmarks requested for next meeting, problems the committee asked the candidate to deal with, concerns of the committee. List items which remain to be completed in order for the dissertation as a whole to be completed; if this is premature, so indicate.

Date of Next Committee Meeting (estimated):

Date of Dissertation (estimated):

Appendix 14. DISSERTATION OR THESIS FINAL EXAM REPORT

Candidate:

Adviser:

Thesis or Dissertation Committee:

- 1.
- 2.
- 3.
- 4.

Date of final exam:

Judgment of the Examining Committee: PASS FAIL

Revisions to dissertation or thesis that are required prior to Director's signature on the face page:

Signatures of the Committee Members:

- 1.
- 2.
- 3.
- 4.

Signature of the adviser confirming that the thesis or dissertation is complete:

Appendix 15. PROSPECTUS SIGNATURE PAGE TEMPLATE

(remove headers prior to using)

Title

A dissertation prospectus/outline presented by

Student

Molecular and Cellular Biology Program

University of Massachusetts, Amherst

Date

Approved by:

(Name), Chair

(Name of Member)

(Name of Member)

(Name of Member)

(Name of Graduate Program Director)
Graduate Program Director
Molecular and Cellular Biology