**Timeline to Degree**  
**Molecular Biology Ph.D.**

1. **1st Year**  
   Completion of BISC 502A and BISC 502B with a grade of a “B” or higher (Screening Exam). Minimum 3.0 overall GPA.

2. **1st Year**  
   Successful completion of rotations in three laboratories

3. **1st Year**  
   Selection of a Dissertation Advisor by end of the spring semester.

4. **1st Year**  
   Selection of Qualifying Exam Committee (following the Screening Examination)

5. **2nd Year**  
   Initiation of dissertation research by the first summer.

6. **2nd/3rd Year**  
   Completion of other required coursework.

7. **2nd/3rd Year**  
   Complete Written Qualifying Exam; pass by end of first semester of 3rd year.

8. **2nd/3rd Year**  
   Complete Oral Qualifying Examination; pass by end of first semester of 3rd year

9. **2nd/3rd Year**  
   Selection of Dissertation Committee (following Qualifying exams)

10. **3rd Year+**  
    Completion of required ethics course by the end of third year

11. **3rd Year+**  
    Defense of Dissertation to MCB and the scientific community
Procedures for the
Graduate Programs in Molecular and Computational Biology

There are two Ph.D. programs in the Molecular and Computational Biology Section: Molecular Biology and Computational Biology and Bioinformatics.

Requirements for the Ph.D. in Molecular Biology:

A. Course Requirements: A minimum of 24 of the 60 units required for the Ph.D. degree must be in course work, exclusive of dissertation research. These must include the core courses, BISC 502a (4 units) and BISC 502b (4 units), to be completed within the first year with no less than a "B" (3.0) in each class. Additionally, students will register for BISC 504L (3 units) and BISC 790 (4 units) for laboratory rotations. Students are required to enroll in BISC 544 (2 units) during the spring Semester of their first year. Students are also required to take the course titled "Practical Statistics and Bioinformatics" during the Fall Semester of their second year (2 units; BISC 576). Participation in the research seminar series (BISC 542, Journal Club, 1 unit) is required each semester for the first three years, and encouraged for the student's entire graduate career. Students are required to enroll in BISC 593 (2 units) during the fall semester of their second year for TA preparation taken before or concurrently with a first TA assignment. Students, in consultation with their Dissertation mentor, must elect to take one additional 4 unit course at the graduate level (400 or 500 courses only).

Registration for first-year students is the following:

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Spring Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>BISC 502A</td>
<td>4 units</td>
</tr>
<tr>
<td>BISC 542</td>
<td>1 unit</td>
</tr>
<tr>
<td>BISC 790</td>
<td>4 units</td>
</tr>
<tr>
<td>BISC 504L</td>
<td>3 units</td>
</tr>
<tr>
<td>BISC 502B</td>
<td>4 units</td>
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<tr>
<td>BISC 542</td>
<td>1 unit</td>
</tr>
<tr>
<td>BISC 504L</td>
<td>3 units</td>
</tr>
<tr>
<td>BISC 593</td>
<td>2 units</td>
</tr>
</tbody>
</table>

Registration for second-year students is the following:

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Spring Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>BISC 542</td>
<td>1 unit</td>
</tr>
<tr>
<td>BISC 576</td>
<td>2 units</td>
</tr>
<tr>
<td>BISC 790</td>
<td>3 units</td>
</tr>
<tr>
<td>BISC 593</td>
<td>2 units</td>
</tr>
<tr>
<td>BISC 542</td>
<td>1 unit</td>
</tr>
<tr>
<td>BISC 790</td>
<td>5 units</td>
</tr>
</tbody>
</table>

Ethics Course: We expect the highest level of ethical behavior from our students. As part of their training, students are required to take a seminar in research ethics within their first three years. Currently, there are two ways to fulfill this requirement. The first is the two-session seminar taught by Executive Vice Provost Michael Quick as part of the Center for Excellence in Teaching (CET). Another option is to take the summer seminar INTD-500 at the Keck School of Medicine. All of these options provide students with a letter of completion at the end of the course. A copy of this letter must be provided to the section office to be placed in your
permanent file.

**Academic Probation**: Students with a GPA of less than 3.0 are automatically placed on academic probation. This can occur at the end of any semester. At the discretion of the Graduate Committee, a student may be allowed a **maximum of three (3) semesters** from the date of entry into the program in which to meet the minimum 3.0 GPA. However, a student with a GPA below 3.0 will not be allowed to receive any financial support without a petition to the Vice Provost for graduate programs. Approval is given for one semester only. Otherwise, the student will be denied further financial support from USC. The graduate committee will decide on the status of a student on probation. There will be no appeal of their decision to the faculty as a whole. The committee may ask a student on probation to take a specific course selected to fulfill a role similar to the core courses to recover from probation. **If, at the completion of that course, the "core course" GPA and overall GPA is not 3.0 or above, the student will be dismissed from the program.** See the section on Academic Performance and Evaluation for more detailed information.

**Limitations of Registration**: Students are not permitted to register for courses outside of required courses without the written approval of their advisor and the graduate committee. Students registering for additional courses without prior approval will be required to drop them. Once a student has passed the qualifying examination, they will register for Dissertation units only, unless the advisor and graduate committee agrees to additional courses.

**Limitations of Degrees**: Students accepted into the Ph.D. Program in Molecular Biology are not allowed to pursue another degree at the University without written approval of their advisor and the graduate committee. If a student applies to and is admitted to another program without the consent of their advisor and the committee they may be dismissed from the program. The student and the advisor should send a signed letter to the graduate committee outlining why the request to enter the additional degree program should be considered. The request needs to be made at least one semester before enrolling in the additional Degree program. We expect all students to be primarily focused on their Ph.D. research projects while they are enrolled in the MCB graduate program.

**Teaching Experience**: Experience in teaching is considered to be an important part of your training. Students are expected to TA for two semesters. **Students who do not TA during their first year are expected to TA for at least two semesters later on; at least one of these should be in the 2nd or 3rd year.** The timing should be chosen in consultation with their advisor. However, they are expected to continue with their dissertation research. Students receive a stipend during the semesters they TA.

Students and their advisors must sign a form requesting a TAship in the semester previous to the desired appointment. **This form is binding**, and students will not be released from the teaching commitment unless they identify another qualified student and advisor who sign a binding form. We take our teaching responsibility seriously and expect our TAs to do the same.
Teaching assignments are determined by faculty, student requests, and student seniority, but above all, departmental requirements. Dissatisfaction with the assignment is not grounds for resigning the position. Students who resign their TA slots and then attempt to regain them will be at the back of the queue and may not be accommodated.

B. Laboratory Rotations
(1st Year)

1. The choice of a research area and a faculty advisor is a major decision made by our graduate students. To assist in this process, as well as to introduce individuals to the nature of basic research, the Molecular Biology program requires graduate students to spend approximately **eight weeks** in each of three laboratory rotations. Students and advisors may discuss research opportunities but are not allowed to make any official commitment to one another until near the completion of the third rotation.

Students must rotate in **three** different faculty research laboratories during their first year. During rotations the student should receive some knowledge of the background of the research area, get some ideas for potential thesis projects, and be introduced to the technology involved, including "hands on" experience in the laboratory. Laboratory rotations are limited to members of the Molecular and Computational Biology Graduate Program (see faculty list in “Directories”), except under special circumstances. Students must confirm their faculty member with Hayley Peltz each rotation; the student and the faculty member must sign a document for verification. If a faculty member is unable to sign, Hayley Peltz must receive email confirmation from the faculty member. Students cannot continue with the rotation unless confirmation is received.

2. Rotations will be assigned on the basis of student requests and available space. Students may request rotations with particular faculty after a series of introductory research talks given during the first weeks of the Fall Semester. Faculty who make these presentations have agreed to take rotation students. However, because of space and funding limitations, no faculty member is required to accept rotation students. Students must confirm their faculty member with Hayley Peltz each rotation; the student and the faculty member must sign a document for verification. If a faculty member is unable to sign, Hayley Peltz must receive email confirmation from the faculty member. Students cannot continue with the rotation unless confirmation is received.

3. Rotation performance is the basis of **BISC 504** (3 units) and **BISC 790** (4 units) credit/no credit grades given by the graduate program chair. For each rotation, the rotation supervisor will file the appropriate approval form. **Satisfactory progress in rotations is an essential component of normal academic progress during the first year.**

4. At the discretion of the graduate committee, students who fail to identify a lab for dissertation research in their first three rotations may be allowed to perform a fourth/summer rotation. However, the department does not have funds for summer rotations and the students generally must find an advisor willing to pay the student as a research assistant. Continued failure to identify an advisor will result in dismissal from the graduate program.
D. **Screening Exam**  
*(1st Year)*

The screening exam is designed to test the students’ general knowledge of molecular and computational biology and related fields. The final exams for BISC 502A and BISC 502B will be used as the screening exam. An average of a B or higher grade across the exams is required to pass the screening exam, and successful completion of the screening exam is required for progression to the written and oral qualification exams. Failure to pass the screening exam is grounds for dismissal from the program. The student may be allowed to retake the final exam(s) during the summer of the same year at the discretion of the graduate committee.

E. **Selection of Dissertation Research Supervisor**  
*(1st Year - must be completed by the end of spring semester)*

1. The Dissertation Research Supervisor must be a member of the Molecular and Computational Biology Graduate Program. Regular faculty members and affiliate faculty members approved by the Graduate School are eligible to chair dissertation committees.
   a.) Students who wish to join the laboratory of a non-affiliated faculty member will be asked to resign from MCB and join their proposed advisor’s affiliated graduate program. This situation is rare because rotations are usually limited to MCB graduate program faculty.
   b.) Admission to a laboratory is entirely at the discretion of the faculty member. No advisor is required to accept any student regardless of rotations or other student status.
   c.) The student, not the program, is responsible for identifying a dissertation advisor.

2. Dissertation research is to be carried out primarily in the laboratory of the dissertation advisor. Being a graduate student is a year-round commitment independent of the academic calendar. You do not get summers off, and you must arrange time for vacation with your advisor. Research does not fit into 40 hour work weeks, so you should expect to spend long hours and weekends in the lab. There is a direct relationship between the time and effort that you put in to your dissertation research, and the quality of and speed to your degree.

3. Both the student and the research advisor retain the right to terminate the advisor/advisee arrangement at any time upon consultation with the Graduate Program director and graduate committee. The Graduate Program is not responsible for placing students in a new laboratory, and will set a deadline for the student to identify a new laboratory. Other programmatic rules remain in effect. An MCB degree requires that the student has completed MCB requirements including written and oral examinations, TAships, and coursework. Therefore senior Ph.D. students transferring into the program are not allowed.

4. Identification of a dissertation advisor by the end of the first year is required to maintain a “satisfactory” rating in the program and is also required to take the Written Qualifying
E. Qualifying Exam Committee Selection
(Paperwork submitted no later than 30 days prior to Written Qualifying Exam submission)

1. Sometime during the second year, you must select your Qualifying Exam Committee. The composition of this committee is usually the same as your dissertation committee. Students must turn in the signed “Appointment of Committee” form (found on the Graduate School website) to Hayley Peltz in order for the USC Dornsife College to approve the committee. This form requires 30 days for processing. Students must also submit the “Request to take the Ph.D. Qualifying Examination” form (found on the Graduate School website) to Hayley Peltz 30 days prior to the Written Qualifying Exam submission. This form may be turned in at the same time as the “Appointment of Committee” form.

2. The Qualifying Exam Committee must have at least five (5) members, at least three of which must have a PRIMARY appointment in MCB (refer to the handbook directory for primary MCB appointment faculty members).

3. The student, in consultation with their Dissertation Advisor, chooses the committee. Students without approved committees may not take their Written Qualifying Exam.

4. By the end of the second year, students should hold a meeting to formalize their Qualifying Exam Committee, complete appropriate paperwork, and assess their degree progress to date.

G. Written Qualifying Examination
(Taken by the end of the 5th academic semester at the latest)

1. The Written Qualifying Exam will consist of a description of the research project of the student organized as a mini-grant proposal. This exam is designed to probe the students’ depth of knowledge of their field of research, their ability to put their studies in the context of the larger field, articulate importance and innovative aspects of their studies, and illustrate preliminary results obtained during the first year of research and a detailed plan of their future research. Students must demonstrate satisfactory research progress.

2. Students must send the specific aims page to all Qualifying Exam Committee members for approval before continuing with the proposal.

3. Students must submit the completed Written Qualifying Exam proposal to all members of the Qualifying Exam Committee for evaluation at least 10 days prior to the Oral Qualifying Exam. If any committee member determines that the written proposal is not satisfactory, the Oral Qualifying Exam may be postponed.

4. The Qualifying Exam Exam must be completed by the 5th academic semester (Fall semester of the third year). Failure to comply within the time limit will result in the student not being permitted to register for the subsequent semester. The research proposal is expected to be an independent project generated by the student. The advisor is required to read and approve the
propose to assure that the students’ work has been generated independently from pre-existing grant proposals and other written exams generated by the same lab. Plagiarism of any kind, including copying parts of a grant proposal of the advisor, will result in expulsion from the program.

5. The written exam will be rigorously assessed and must be at least 10 pages double-spaced with 0.5-inch margins and 11-point font. The introduction of the project should correspond to the first chapter of the student’s dissertation and present an exhaustive review of the field. The research proposal is expected to be roughly organized as an NIH grant, as follows:

1 Page: Specific Aims
2.5 Pages: Introduction.
0.5 Page: Significance and Innovation
3 Pages: Preliminary results
4 Pages: Research plan (such as 3 Aims, each structured in sub-Aims)

An abstract must be added at the beginning of the proposal. Figures, figure legends and literature referenced throughout the proposal should be added at the end of the proposal (no more than 10 figures, no page limit for literature).

6. Students who fail the Written Qualifying Examination may be dismissed from the program.

G. Oral Qualifying Examination
(Taken or scheduled to be taken by 5th academic semester at the latest – no more than 60 days after Written Qualifying Exam)

1. The oral examination will consist of a presentation of preliminary results and a research proposal to the Qualifying Examination Committee. Students are expected to have extensive knowledge of the literature related to their project as well as the general literature in their field. They are also expected to have extensive understanding of the techniques used in the field, their approaches and preliminary results. They are expected to discuss their research plan in great detail, potential problems and alternative strategies. Advisors are allowed to attend the oral exam, but should not speak for their student and will not vote on the outcome. The Qualifying Examination Committee may ask the advisor to recuse themselves if they are disruptive.

2. The Oral Qualifying Examination must be taken or scheduled to be taken by the 5th academic semester (Fall semester of the 3rd year) at the latest. The Oral Qualifying Examination must be taken within 60 days of the Written Qualifying Exam procedure. Failure to comply within the time limit will result in the student not being permitted to register for the subsequent semester.

3. If two or more Qualifying Exam Committee members vote to fail the student in their Oral Qualifying Exam, he or she will be dismissed from the program. In exceptional
cases, the Graduate Committee might decide to allow the student a second chance to pass the qualification exam, which must be taken within three months.

H. **Dissertation Committee Selection**

1. Upon successful completion of the Oral Qualifying Examination, the student must select the Dissertation Committee. The student, in consultation with their Dissertation Advisor, chooses the committee.

2. The Dissertation Committee must be composed of at least four faculty members, three of which must have primary appointments in Molecular and Computational Biology. This is generally composed of the same members as the Qualifying Examination Committee.

3. Students must turn in the signed “Appointment of Committee” form (found on the Graduate School website) to Hayley Peltz in order for the USC Dornsife College to approve the committee. This form requires 30 days for processing.

I. **Doctoral Dissertation**

1. Upon successful completion of the Written and Oral Qualifying Examinations, the student is advanced to candidacy for the Ph.D. The student must register for BISC 794 (Doctoral Dissertation) during every semester in residence, excluding summers, until completion of defense and must register for these courses in order (A,B,C,D, and then Z until graduation).

2. Students are required to meet with their Dissertation Committee each year. The first meeting after the Oral Examination should include a formal proposal of the dissertation topic. Failure to meet with the committee each year will result in a hold being placed on registration. Suitable progress in dissertation research must be demonstrated at each yearly meeting to maintain good standing in the program. Students who fail to make satisfactory and timely progress may be dismissed from the program. A brief report of these meetings should be filed each year with Hayley Peltz by the student’s dissertation advisor.

J. **Defense of the Dissertation**

1. The defense of the dissertation will be a public seminar of the final draft of the dissertation. In most cases, a defense oral will suffice if approved by the dissertation committee in the required pre-defense meeting.

2. Prior to scheduling a defense date, and upon approval from their dissertation advisor, students must meet with Dawn Burke to ensure all program requirements have been met.

3. The student must register for BISC 794 in the semester that the defense is planned (except during the summer session) and submit the title and date of the defense to the Graduate School no later than thirty days prior to the defense. A copy of the dissertation must be provided to committee members a minimum of two weeks before the defense to allow for thorough evaluation.
4. The student must have all Dissertation Committee Members sign the “Approval to Submit” form. Submission instructions can be found on the Graduate School website: http://www.usc.edu/schools/GraduateSchool/current_thesis_dissert_02.html

5. Please note: The Department will prepare 3 bound copies of the dissertation at no charge to the student. One copy is for the student, one for the dissertation adviser, and one for the department.

Additional information about requirements of the program can be found in the University of Southern California Catalogue: http://catalogue.usc.edu/.
Many of the forms, policies, and procedures can be found at the Graduate School’s website: http://www.usc.edu/schools/GraduateSchool/current_guidelines_forms_03.html

Information contained in this section serves as a guide and is subject to change as we continually improve the educational experience of our Ph.D. candidates.