Graduate Program in
Cell, Molecular and Developmental Biology

University Of California, Riverside

STUDENT AND FACULTY HANDBOOK

INTRODUCTION

This handbook is designed to provide you with information that will be helpful to you as a participant in the Cell, Molecular and Developmental Biology graduate program at UCR. We hope that you will read it carefully and consult with it as needed when you have questions about the program. In addition, please feel free to contact the Director, Graduate Advisors, and Graduate Student Affairs Officer for additional information or clarification.

The handbook includes the names and contact information for all participants in the program, provides an overview of the academic objectives and requirements of the program, and time-tables for the completion of degree objectives. It also contains information to help orient new students to the campus and it describes special features of our program and resources of our campus.

Because our program is interdepartmental, it provides a very broad framework for interactions and learning in the area of Cell, Molecular, and Developmental Biology. We hope that you will take full advantage of the opportunities that our program has to offer while you are at UCR.

Additional information about our Program and Faculty is available at our web-site: www.cmdb.ucr.edu.

CURRENT PROGRAM OFFICERS

Program Director – **Dr. Jeff Bachant** (2113 Biological Sciences Building) is responsible for overseeing and administering the CMDB program. E-mail jeffbach@ucr.edu, x2-6473

Associate Director – **TBA** Chairs the CMDB Curriculum Committee and serves as senior program officer when the Program Director is away.

Graduate Advisor for Recruitment – **Dr. Kathryn DeFea** (1116A Webber Hall) is responsible for overseeing the recruitment of new students and processing of graduate student applications. Chair of the Admissions Committee. E-mail katied@ucr.edu. x2-2871.

Graduate Advisor for Continuing Students–**Dr. Patricia Springer** (3107B Genomics Building) supports continuing graduate students. E-mail pspringer@ucr.edu x2-5785.

Graduate Student Affairs Officer – **Kathy Redd** (1140B Batchelor Hall) maintains graduate student files and advises students on administrative and personal aspects of graduate studies. E-mail kathy.redd@ucr.edu. x2-5621

*The other staff in the **CNAS Graduate Student Affairs Center** (1140 Batchelor Hall) can also assist you when Kathy Redd is not available.*

BNN (Biology, Cell Biology & Neuroscience, and Natural Reserve System) Business Office

This office provides administrative support to the CMDB program. Hours for the Business Office are 7:30a.m.-12:00p.m. and 1:00p.m.-4:30p.m, M-F and they are located in the Life Sciences Building. Please see the BNN Administrative Unit Guide in Section 4 of this Handbook.

CMDB ENTRANCE REQUIREMENTS

Students who do not complete all of these requirements prior to admission may be required to fulfill deficiencies during the program. For more information contact the Graduate Advisor or Student Affairs Officer:

____1 SEM or 2 QTRS Calculus (MATH 9A-B or equiv.)
____1 YR Physics (PHYS 2 A-C or equiv.)
____1 YR Inorganic Chemistry (CHEM 1A-C or equiv.)
____1 YR Organic Chemistry (CHEM 112 A-C or equiv.)
____1 YR Introductory Biology (BIOL 5A-C or equiv.)
____1 COURSE Biochemistry (BCH 100 or BCH 110A or B or C or equiv.)
____1 COURSE Genetics (BIOL 102 or equiv.)
____1 COURSE Statistics (STAT 100A or equiv.)
____2 upper division COURSES in cell, molecular or developmental biology (BPSC 135 or BIOL 111 or BIOL 107 or BCH 110C or equiv.)

Graduate Advisor Notes:

CMDB Degree Requirement List 2015-1016

REQUIREMENT I

____CMDB 203

REQUIREMENT II: **All students** are required to take one graduate level course in each of the three categories:

CELL BIOLOGY
At least one course from the following:
____BPSC 237 –Plant Cell Biology (4) (Fall)
____CMDB 200 –Cell Biology (4) (Winter)
____NRSC 200A –Fundamentals of Neuroscience (3) (Fall)

MOLECULAR BIOLOGY
At least one course from the following:
____BCH 211 –Molecular Biology (3) (Fall)
____BPSC 231 –The Plant Genome (4) (Winter)
____CMDB 201 –Molecular Biology (4) (Fall)
____NRSC 200B –Fundamentals of Neuroscience (3) (Winter)

DEVELOPMENTAL BIOLOGY
At least one course from the following:
____BPSC 232 -Plant Development (4) (Spring)
____CMDB 202 -Developmental Biology (4) (Spring)

REQUIREMENT III
Ph.D. students only are required to take at least one of the following 3-or 4-unit courses or two of the 2-unit courses from the menu below. Alternatively, any course from the list above (other than the three used to fulfill Requirement II) may be taken.

____BCH 210 -Biochemistry of Macromolecules
____BCH 212 -Signal Transduction & Biochemical Regulation
____BIEN 233- Computational Modeling of Biomolecules
____BIEN 245- Optical Methods in BIOL, CHEM, and ENGR
____BIOL 221/MCBL221 -Microbial Genetics
____BPSC 201EZ -Methods in Plant Biology (1-2 units)
____BPSC 210 -Methods in Arabidopsis Research
____BPSC 234 -Statistical Genomics
____BPSC 239 –Adv. Plant Physiology
____CHEM 284 –Biological Mass Spectrometry (2 units)
____CMDB 204 –Genome Maintenance & Stability
____CMDB 205 –Signal Transduction Pathways in Microbes & Plants
____CMDB 206 - Gene Silencing
____CDMB 207 – Stem Cell Biology and Disease
____CMDB 209 - Ribonucleic Acid (RNA) Biology
____CMDB 210 – Molecular Bio of Human Disease Vectors
____CMDB 220 – Chem Genomics Design Studio (2 units)
____CS 235 -Data Mining Techniques
____CS 238 -Algorithmic Techniques in Computational Biology
____GEN 241-Advances in Bioinformatics and Genomics
____GEN 242-Data Analysis in Genome Biology
____ENTM201-Core Areas of ENTM, Sub Cellular/Cellular
____ENTX 202 -Mechanisms of Toxicity
____MCBL 202-Microbial Pathogenesis and Physiology
____PHYS 265-DNA Computation (2 units)
____PHYS 283-Techniques in Microscopy (2 units)
____PLPA 207 –Bacterial and Viral Diseases of Plants
____PLPA 219 -Molecular Plant Virology
____OTHER (with consent of Graduate Advisor)

REQUIREMENT IV
All students are required to take the Graduate Seminars (257, 258) in *Cell, Molecular, and Developmental Biology* each quarter offered in residence.

____CMDB 257 ____CMDB 258

In addition, if a laboratory holds regular lab meetings, students should enroll in 1-2 units of CMDB 250 per quarter. Please note that students are only allowed to enroll in one class per quarter which provides credit for lab meetings (for example, you may not take CMDB 250 and BCH 240 at the same time).

REQUIREMENT V
All Students are required to take one graduate seminar course in his/her area of specialization.
____ ____ BCH 230 or BIOL/CMDB 281 or BPSC 240 or NRSC 289 ____ ____ OTHER (with consent of Graduate Advisor)

REQUIREMENT VI (Ph.D. Only)
Ph.D. students must fulfill a two quarter teaching requirement
Course/Quarter_____ Course/Quarter_____

PROCEDURES FOR WAIVING OR SUBSTITUTING COURSEWORK REQUIREMENTS

Enrolled students asking for exemption from program coursework must submit a General Petition the CMDB Graduate Advisor with a statement of justification and supply documentation (transcripts, course syllabi, etc). Some requests may require Executive Committee review.

GRADUATE DIVISION REQUIREMENTS

For information on specific Graduate Division requirements, please refer to the UCR Graduate Student Handbook (http://www.graduate.ucr.edu); to the Graduate Studies section of the University of California, Riverside General Catalog; and to the Graduate Division's web site (http://www.graduate.ucr.edu).

CMDB General Student Petition

Name:_____

Request:

Reason for request:

Approvals:

Student:_____ Date:_____

Major Professor:_____ Date:_____

Graduate Advisor:_____ Date:_____

Protocol for CMDB Student's
ANNUAL RESEARCH PROGRESS EVALUATION (ARPE)

Each CMDB student is required, by both the Graduate Division and the CMDB Program, to have an Annual Research Progress Evaluation (ARPE). This will allow determination of whether the student is making normal and acceptable progress towards completion of her/his Ph.D. dissertation or MS thesis. Each student must hold an annual ARPE meeting with all the members of her/his Advisory /Dissertation Committee by June 30 for each year the student is enrolled. During or following the meeting, the student's Guidance Committee must prepare a written evaluation using the CMDB ARPE Committee Report to be reviewed and signed by the student and all the Committee members. Copies of the signed report must be given to the student and each Committee member and a scanned copy of the signed report e-mailed to Ms. Kathy Redd (Kathy.redd@ucr.edu) in the CNAS GSAC by July 15 each year. Students who do not complete the ARPE process by July 30 will be declared "not in good standing". These students will have a hold placed on their fall quarter enrollment and must schedule a meeting with the Graduate Advisor and propose a plan to fulfill their ARPE requirement in a prompt manner. Students who remain classified as "not in good standing" will not be eligible for Teaching Assistant appointment or for financial support from the CMDB Program. Once the Graduate Advisor is satisfied that the ARPE requirement has been met, a recommendation will be made to the Director to restore the student to "good standing" within the program.

After review of the student's ARPE report by the appropriate CMDB Graduate Advisor, the CMDB Student Affairs office will forward the report to the Graduate Division.

General Protocol for ARPE:

The ARPE will be initiated by the student preparing a written report (see details below), completing the online ARPE form at:
https://ucrbsgsac.wufoo.com/forms/cmdb-annual-research-progress-evaluation-2016
(year changes annually) by June 20 each year.

Students are also responsible for scheduling, several weeks in advance, a time, date and location for the meeting of her/his Guidance/ Dissertation/Thesis committee. The report must be attached to the online ARPE form. The student and the major professor will receive a copy of the student's submission and report which can then be distributed to the rest of the committee.

The meeting will be chaired by the student's major professor. At the meeting, the student will make a 25 - 45 minute oral presentation, augmented by slides or other visual aids, if necessary, and answer questions raised by the Committee. The last phase of the meeting will be a private discussion of the Committee members to evaluate the student's annual research progress. The meeting will be concluded by the Committee sharing its conclusions and the CMDB ARPE Committee Report with the student.

Student's Annual Written Research Report (this is required to be submitted with the ARPE Online form): The student's written research report should not be simply a recapitulation of the student's oral presentation to her/his Advisory Committee. The written research report is a formal document that should be prepared according to the guidelines provided in the paragraphs below. It must be comprehensive and allow for being understood by a reader who would not attend the student's Advisory Committee presentation. Each student's Annual Research Progress Evaluation written report will be reviewed by the appropriate Graduate Advisor.

Page #1 Background and Introduction: There should be no more than 1 page of Introduction that will allow the reader to understand the context and starting point for this year's research evaluation; literature citations are not needed. The Introduction should conclude with an enumeration of 2-3 key research questions (goals) that will be covered in this year's evaluation.

Pages #2-6 Research Data: Summarize the key results (both positive and negative) as Figures and Tables using experimental data obtained over the past 12 months. Each Figure and Table should have a title and a legend that will permit the reader to understand the experiment; the extent of legend detail should be

similar to that utilized by the Journal of Cell Biology. Also, under each legend, one or two sentences explaining the purpose of the experiment should be provided. The written report is limited to no more than 5 pages of data presentation; additional results may be included in the student's verbal presentation. No narrative of the results, discussion or reference citations should be included in the report.

Page #7 Major Points: Following the Research Data pages, a list of the significant conclusions revealed or supported by the experimental data should be written. Each conclusion or point should be limited to no more than two sentences. These points may be verbally and graphically amplified and discussed in the student's oral presentation. Collectively, they should answer the question "What have you learned in the past 12 months?" This page should be concluded with an enumeration of 2-4 research goals for the following year.

Page #8 Additional Information on the Student: All information solicited here pertains to the previous 12 months. Provide the following information on a page titled "Additional Student Information". (a) List the courses you completed with their grades. (b) Indicate whether you completed your written qualifying exam (date) or oral qualifying exam (date). (c) List any scientific papers or abstracts that you authored or co-authored that were formally published; provide a complete citation using the reference style of the Journal of Cell Biology. (d) List any scientific meetings that you attended; list the name of the meeting and where it was held, the approximate number of attendees and describe your contribution(s) (platform talk, poster, observer, etc.). (e) List any awards you have received.

Instructions for Student Preparation of the ARPE Report

The ARPE document should be typed in font 11 or 12 (with each page numbered in the lower right corner). A Header for each page should list the students first and last name and the scheduled date and location of the Advisory/Dissertation Committee meeting**. The student is required to attach the ARPE Report to the Online ARPE form and to submit both by June 20 each year.** Once submitted, the student and major professor will receive a copy of his/ her online submission and the report in an e-mail which needs to be forwarded to the rest of the committee at least one week before the scheduled meeting. The student is responsible for scheduling the ARPE meeting and reserving a room for the meeting. Also the student should send an e-mail reminder to each Committee member 24 hours in advance.

ARPE Guidance Committee Report

The student's Major Professor, acting as Chair of the Guidance/Dissertation Committee is responsible for preparing the required formal written report concerning the student's Annual Research Progress Evaluation. The form will be e-mailed to all major professors with the ARPE call each spring, but will also always be available at http://cmdb.ucr.edu/current-students.html

The Report should be completed at the ARPE meeting and all Committee members should sign the report. Copies of the signed report must be given to the student and each Committee member and a scanned copy of the signed report e-mailed to Ms. Kathy Redd in the CMDB Student Affairs office by July 15 each year.

THE ACADEMIC PROGRAM (M.S.)

To help you plan your program and monitor your progress, a Time Table Checklist for the M.S. Degree appears at the back of this section.

The M.S. degree is a research degree that requires the completion of a thesis. The CMDB Graduate Program does not offer a "coursework" M.S. degree. M.S. students generally concentrate on formal coursework during the first year and on research the second year.

The degree requires completion of 36 units of coursework. Twenty-four units must be in appropriate graduate courses (200 series), a maximum of 12 of 290-299 may count toward the degree. The remaining 12 units can be taken either in the 100 or 200 series. Students must take four CMDB core courses, the Seminar in Cell, Molecular; Developmental Biology (257) & the Graduate Student Seminar in CMDB (258) each quarter they are offered; plus one graduate seminar (see checklist for course requirements in Section 1 of the handbook).

CMDB 257 (a series of seminars presented by distinguished outside speakers) every quarter in conjunction with the Graduate Programs in GGB and MCBL. **Students are required to register for CMDB 257 each quarter it is offered.**

CMDB 250 Special Topics in Cell, Molecular, and Developmental Biology provides students with a way to earn course credit for organized laboratory meetings. Students may enroll in 1-2 units per quarter. Please note that students are only allowed to enroll in one class per quarter which provides credit for lab meetings (for example, you may not take CMDB 250 and BCH 240 at the same time).

The following is a timeline guide for students pursuing the M.S. degree:

1) **Meet with the Graduate Advisor as soon as possible** in your initial quarter of study. He/She will work with you to design an appropriate academic course of study for your degree plan and will help you select an appropriate major professor. You may undertake two research rotations during your first quarter of study. Once you have chosen a major professor, you will choose a Guidance Committee (3 member committee that includes your Major Professor) in consultation with your major professor and the Graduate Advisor.

2) **In the first year, take basic coursework** and complete the core requirements for the program. Students who are admitted to graduate standing lacking CMDB entrance requirement courses may be required to take appropriate undergraduate courses.

3) **Select a Guidance Committee** in consultation with your chosen Major Professor by the end of your second quarter. Use this form to nominate the committee: https://ucrbsgsac.wufoo.com/forms/cmdb-guidance-committee-nomination-form/

4) **Plan and begin a research project during the second quarter**, select a major professor and prepare a brief description of the proposed research to present to your Guidance Committee.

5) **Make substantive progress on your research during the third quarter**. By the end of your first year of graduate school, your research project should be well planned and substantially underway.

6) **Meet with your Guidance Committee** during your third quarter in residence, to discuss your progress in the program and complete the Annual Research Progress Evaluation (ARPE).

7) **Carry out your Thesis Research during the summer and the second year**. Confer with your Major Professor regarding the format of your thesis. The format is somewhat flexible, but must meet with the approval of the Thesis Committee and the Graduate Division. Choose your Thesis Committee (3 member committee that includes your major Professor) in consultation with your major professor and the Graduate Advisor. Use the following form to nominate your committee: https://ucrbsgsac.wufoo.com/forms/cmdb-dissertation-or-thesis-committee-form/ Your Thesis Committee may be the same as your Guidance Committee. Once approved by CMDB, you may enter it on your Advancement to Candidacy form.

8) File an Application for Candidacy for Master of Science Form the quarter you expect to graduate. You can get this form from the Graduate Division web site at: http://graduate.ucr.edu . It requires a portion to be completed by you and your Major Professor and another portion to be completed by Kathy Redd and the Graduate Advisor.

9) Have your Thesis Committee review a draft of your thesis

10) Defend your thesis.

11) Provide Kathy Redd with a copy of your thesis for CMDB to have bound for the program's library.

CONTINUING FROM THE MASTER'S TO THE DOCTORATE

Students who are enrolled in the M.S. program may petition to pursue the Ph.D. degree. To do so, they must have the recommendation of the Executive Committee. Approval by the Executive Committee is not automatic; the Committee determines on a case-by-case basis whether a student has the academic potential to succeed in the Ph.D. program. For further information on the process of petitioning to the Ph.D. program, please see the Graduate Student Affairs Officer.

Satisfactory Academic Progress

Normative time to the M.S. degree in CMDB is two years (six quarters). Normative time is defined as the period of full-time registration required to earn the degree, assuming that the student enters with a bachelor's degree and has no course deficiencies or need to take any remedial work. As stated above, in the CMDB Program, the individual student's program of study is planned first in consultation with the Director and Graduate Advisor, then in consultation with his or her Guidance Committee, which supervises the student's progress prior to the appointment of the Thesis Committee. The Thesis Committee oversees the student's progress in the final stages of his or her degree program.

For all students, evaluations of progress are carried out each spring/summer. Students meet with their Guidance or Thesis Committee, and the student's Major Professor submits the Annual Research Progress Evaluation to the Graduate Advisor summarizing the discussion of the Committee. The Graduate Advisor is then responsible for making specific recommendations to the Graduate Division concerning the student's progress. The Graduate Advisor may also approve exceptions to the normal time schedule occasioned by unusual circumstances. Students are provided with a copy of the annual evaluation, and copies are forwarded to the Graduate Division.

Unsatisfactory Academic Progress

It is expected that students will make good progress in the CMDB degree program. The Graduate Division will block registration of students who fail to perform satisfactorily. In addition, unsatisfactory academic progress severely limits opportunities for receiving funding through the Program. Students are considered to be making unacceptable progress when:

- they fail to fulfill program requirements in a timely and satisfactory manner.
- the overall GPA drops below the minimum level of 3.50 for fellowship recipients; 3.25 for those holding TA appointments, or 3.00 for non-supported students;
- they have 12 or more units of "I" grades.
- the Major Professor feels that the student is not making normal progress in the laboratory.

TIME TABLE CHECKLIST FOR M.S. DEGREE

Name: _____ Quarter entered degree program:_____

Chair of Guidance Committee: _____

Members of Guidance Committee: _____

_____

	Target Date	Date Completed:
Year 1		
Meet with Director and Graduate Advisor	1st quarter	_____
Select a Major Professor	2nd quarter	_____
Select a Guidance Committee	2nd quarter	_____
Plan and initiate research project	2nd quarter	_____
Meet with Guidance Committee	3rd quarter	_____
Annual Research Progress Evaluation	3rd quarter/summer	_____
Year 2		
Name Thesis Committee	4th quarter	_____
Submit thesis to Committee	5th or 6th quarter	_____
Meet with Thesis Committee	6th quarter	_____
Annual Research Progress Evaluation	6th quarter/summer	_____
File advancement to candidacy paperwork	6th quarter	_____
Present research results at Research Symposium	Spring Quarter	_____
Defend thesis	final quarter	_____

THE ACADEMIC PROGRAM (PH.D.)

To help you plan your program and monitor your progress, a Time Table checklist is located in the back of this section. The following list provides more detailed information on the steps you need to take to advance to candidacy.

The main goal of our program is to enable students to acquire modern perspectives and technical skills in Cell, Molecular and Developmental Biology and to foster initiative and imagination that will lead to productive careers in academia, government, and industry following graduation. The Ph.D. degree requires demonstration of broad knowledge in the area of Cell, Molecular, and Developmental Biology and substantive ability in original research.

The recommended normative time for completion of the Ph.D. degree requirements is fifteen quarters (5 years). During the first two years, emphasis is on coursework and completion of the qualifying examinations, as well as research. The remaining three years are devoted primarily to research and to the writing and defense of the dissertation, although students continue to participate in graduate seminars and may take additional coursework during this period.

Briefly, you are expected to achieve the following major goals during your time in the program:(1) complete core course work by the end of your 1st year (see Section 1 for course checklist for Ph.D.), (2) prepare a research proposal, pass the Written and Oral Qualifying Examinations, and advance to candidacy by the start of the seventh quarter, and (3) produce and file your dissertation by the end of your fifteenth quarter.

The following is a guide to achieving these goals:

1. **Schedule a meeting with the Graduate Advisor soon after arriving at UCR.** The Graduate Advisor will help you to design a course of study which will: (a) make up any course deficiencies; (b) meet the Program's course requirements and (c) prepare you for research in your chosen area of specialization. The Graduate Advisor will also assist you in the selection of rotations, which lead to your identification of an appropriate Major Professor. The Major Professor will serve as Chair of your Guidance and Dissertation Committees and has the critical role of mentoring your scientific development. The Major Professor provides the research facilities and the intellectual guidance required to complete the dissertation. Students may select a Major Professor any time during the 1st three quarters of enrollment.

2. **Begin** research **rotations.** Students are strongly urged to complete at least two rotations during their first academic year at UCR. Rotations provide you with an opportunity to explore different research areas under CMDB faculty. In consultation with individual faculty members and the Graduate advisor, you will determine a rotation plan. Rotations can be flexible; most are either 5 or 10 weeks in length. During each rotation, you will work on a research project under

the guidance of a faculty member and others in the lab. The goal of a rotation is to learn about the lab so that you can understand the experimental system, the research questions, and the lab culture. Rotations give you an opportunity to learn new approaches and techniques. Perhaps most importantly, rotations allow you to learn about the faculty member's mentoring style and determine how well you it suits you. In turn, the faculty advisor uses the rotation to evaluate qualities such as your work ethic, enthusiasm, experimental skills, and whether the research topic seems like a good fit for you. In addition, he/she will assess how well you will fit into the lab culture and will ultimately decide if he/she can work with you for to direct your dissertation research. It is essential that you understand the expectations of each faculty member you are rotating with. You should discuss this with them at the beginning of each rotation. Your performance in each rotation will be evaluated by the faculty member.

3. **Select a Guidance Committee** in consultation with your chosen Major Professor by the end of your second quarter. Use this form to nominate the committee: https://ucrbsgsac.wufoo.com/forms/cmdb-guidance-committee-nomination-form/

4. **Complete course requirements.** These include 4 core courses and 1 elective, plus one additional 2-unit graduate special topics seminars (from an approved list). CMDB 257 (a series of seminars presented by distinguished outside speakers) is offered every quarter and is combined with the Graduate Programs in MCBL and GGB. Students are required to register for CMDB 257 and 258 each quarter they are offered.

5. **Complete your teaching requirement.** A minimum of two quarters of service as a Teaching Assistant in cell, molecular, developmental or related-area courses is required regardless of whether financial support comes from Fellowship or Research Assistantships, etc. Teaching may be done at any time but it is recommended that it be done in the **third** or **fourth** years. All students are required to complete TA Training through the Teaching Assistant Development Program (TADP). Please see the TADP website for more information http://www.tadp.ucr.edu

6. **Complete the Qualifying Examinations.** The qualifying examination consists of three parts: research proposal, written, and oral. (See protocols on following pages)

CMDB Graduate Program - Ph.D. Qualifying Examination

The CMDB Ph.D. Qualifying Examination consists of three parts:

1) The Written Examination- consists of questions written by the Qualifying Examination Committee and answered by the student over 2-3 days depending on the

number of questions. The Qualifying Exam Committee determines if the student passes the written exam and may proceed to the Oral Exam.

2) The Research Proposal- an NSF or NIH style research proposal written by the student concerning his/her Dissertation Research Project, approved by the Major Professor, and distributed to the Qualifying Exam Committee at least 4 weeks prior to the Oral Examination.

3) The Oral Examination- An oral examination where the student makes a 45-60 minute presentation on the proposed Dissertation Research Project followed by questions from the committee.

Ph.D. Qualifying Exam Committee
The Ph.D. Qualifying Exam Committee should be formed at least three months before the anticipated written exam date. This provides adequate time for study and arrangement of dates for written and oral exams.

The Qualifying Examination normally occurs near the end of the second year of the student's graduate program. Students who fail to schedule a qualifying exam within a three year period, will be evaluated on a case by case basis by the Executive Committee for continuation in the program. The student, working in consultation with the Major Professor, chooses the Chair of the Committee, the outside member, and two other CMDB faculty members. The student must speak to each faculty member nominated for the Qualifying Examination Committee and confirm his/her willingness to serve in this capacity. The student then completes the online Qualifying Examination Committee Nomination Form at:

https://ucrbsgsac.wufoo.com/forms/cmdb-qualifying-exam-committee-nomination-form/

The CMDB Executive Committee selects the final member of the committee, the SAO prepares the nomination form, the Graduate Advisor signs, and the committee is submitted for Graduate Division Approval. Graduate Division notifies the student and the program when the committee is approved.

Scheduling the Exams
Once the Qualifying Exam Committee is approved, the student consults with the members of the Qualifying Examination Committee to establish specific dates for the written and oral examinations. Students should be aware that it is often difficulty to find dates for the oral and written exams due to the busy travel schedules of faculty. An early commitment to exam dates helps to avoid scheduling difficulties. The student (in consultation with the Committee Chair) is responsible for identifying and reserving rooms for the written and oral exams. The CMDB Graduate Student Affairs Officer will help with room scheduling if needed.

The student notifies the Committee members of the date and location by e-mail as soon as they are established. Students should set study plans with committee members approximately 3-4 months prior to the exam. The expected time dedicated to preparation for the exam should be discussed with the student's major professor. At least 4 weeks prior to the Written Qualifying Examination, the student is required to provide a hard copy of the research proposal to each member of the Qualifying Examination Committee.

The Written Examination
All of the Qualifying Examination Committee Members except the Outside member must submit questions for the written portion of the examination to the Chair of the Qualifying Examination. The Outside member has the option to contribute questions for the written examination.

Each Committee Member submits questions that the student is expected to answer over a maximum three hour period. Most Committee members require the student to answer the Written Exam questions without the aid of notes, books, Internet, or other resources. Each Qualifying Committee Member may waive some or all of these conditions. Cell phones or any other device that can access information are not permitted unless specifically approved by the committee member whose set of questions is being answered.

The student has two options for recording their answers to the written examination questions. They may write their answers on paper or use a departmental computer that lacks internet access. If drawings, tables or graphs are needed to answer a question, they will need to be hand drawn and referred to in the text.

On each morning of the Written Examinations, the student should go to the Committee Chair's office. The student will choose the order of the exams. The Chair will bring the student to the examination room and ensure that only admissible items enter the room. After the student completes the first exam, the student returns the answers to the Chair. The student will then take a break and arrange for a time to begin the second exam. The Chair will let the student know the outcome of the exams and direct the student to speak with Committee members. A course of action to remedy any deficiencies in the Written Exam should be discussed with the student.

Students "Pass" or "Fail" this exam; there is no "qualified" pass or fail.
1. Written Exam - A Pass: To proceed to the oral exam, a student may fail no more than one of the written exams.
2. Written Exam - A Failure: If the student fails two or more exams, the Qualifying Examination Committee will determine if the student should be allowed to retake the Written Examination. The Committee will recommend a timeframe for the second attempt. Based on the overall performance, the Qualifying Examination Committee will decide how many and which of the exams will be retaken. A student may retake the Written Exam once. It is expected that the written exams will be completed no later than the end of the student's third year.

The Research Proposal
The focus of the Oral Examination will be a Research Proposal written by the student that s/he proposes to carry out for her/his Ph. D. dissertation. This document serves as a basis for examination and assessment by the Oral Qualifying Examination Committee of the following: (a) the ability of the student to write a concise and clearly written research proposal, (b) the student's fundamental knowledge in the area of her/his research, (c) the student's ability to identify a meaningful research project, (d) the student's ability to design and carry out productive meaningful research, and (e) the student's sophistication in describing the scientific literature germane to the proposed project.

The Proposal should not exceed 12 pages not counting the Title Page and the Literature Cited section. The space required for all figures and Tables is included in the 12 page limitation. The entire document should be typed single spaced in a 11 or 12 point font.

The Title Page

The following Statement must be placed at the top of the Title page: Research Proposal for CMDB Qualifying Examination on 'month, 'day', 'year'. This should be followed by the following items, spaced neatly down the Title page.

a) An informative title that captures the essence of the proposed research project

b) The official UCR name of the Candidate.

c) The statement 'Major Professor' followed by the name of the candidate's Major Professor, followed by a signature line. Underneath the signature line the following should be typed "Approved for distribution".

d) The full name and departmental affiliation of each of the five members of the Oral Qualifying Examination Committee.

Section A: HYPOTHESIS AND SPECIFIC AIMS.

An Abstract (limited to 400 words) that includes the following:

a) A concise articulation of the dissertation's overall objectives and the specific goal(s) of the research proposed, e.g., to create a novel experimental design, to solve a specific problem, or to address a specific barrier in your field. You may choose to formulate your own hypothesis. This information is then immediately followed on the same page by the following;

b) An explicit listing of the titles of the Specific Aims in Section D of your Research Proposal. These titles should exactly match (word for word) the wording that is contained in Section D of the research proposal.

Section B: BACKGROUND

This section is limited to no more than three pages. This section should provide the following background information to the proposed Research Proposal.

a) A brief review of the literature that is appropriate to bring the Committee members up to speed with the 'state of the art' of recent research in the general area of your research proposal.

b) Appropriate citation of the available literature in this area. See comments on the bibliography formatting below.

c) This section may include figures and tables as are deemed to be helpful; their area must be included in the six pages allowable for this section.

d) All Figures and Tables should be separately numbered, in sequence, throughout the entire document.

e) Each Figure and Table must have a title, and, if needed, a legend that provides appropriate further description to assist the reader in understanding the figure/table; e.g. reference to experimental methodology, that may or may not require reference citation(s).

Section C: SIGNIFICANCE OF THE PROPOSED RESEARCH

This section can be up to one page in length. In this section, the Candidate should include the following:

a. A concise description of the background leading up to the Research Proposal,
b. A critical evaluation of existing knowledge and identification of the gaps that the project is intended to fill.
c. A description of the importance of the proposed research by relating the Specific Aims to the long-term direction of research in the field.

Section D: RESEARCH DESIGN AND RESULTS OBTAINED TO DATE
This section may be up to seven pages in length. It should include a layout in a logical fashion of the method of prosecution of the overall research objective being proposed for your Ph.D. dissertation and, also, it should include the preliminary data you have already obtained. The section should contain the following.

a) This section should be subdivided into as many primary sub-sections as the Specific Aims that were listed in section A.
b) Each primary Specific Aim may be broken down into as many or few secondary sub-Specific Aims as the candidate feels appropriate or necessary for the experiments being proposed.
c) Each Aim and sub- Aim should provide some kind of Rationale statement, followed by a brief introduction and then a section titled Experimental design(s).
d) The presentation of Preliminary Data should include appropriate Tables with titles and brief legends and Figures and with figure titles followed by informative succinct legends.
e) Remember that all figures and all tables should be separately numbered sequentially throughout the entire proposal.

Section E: LITERATURE CITED
The pages of this section are not included in the page limitation of 12 pages.
Citations and references may be formatted either in a numbered sequence or alphabetically. Scientific journals can provide examples of these styles, and students are encouraged to use programs such as Endnote to begin to learn to manage their references.

Other information
The following standard sections of NSF and NIH grants should not be included in the candidate's Research Proposal: Table of Contents; Budget Information, Biographical Sketches; Available space and equipment; Animal use assurances; Checklist, and Appendix.

Approval of Research Proposal by your Major Professor.
Prior to distribution of your Research Proposal to your Committee, you must obtain your Major Professor's signature on the Title Page indicating that it is "Approved for distribution".

Distribution of final Research Proposal
After signature approval has been obtained, a hard copy of your proposal should be given to all members of the Qualifying Exam Committee at least four weeks (30 days) before the scheduled examination. Also, send one scanned electronic copy of your Proposal to

Ms. Kathy Redd (kathy.redd@ucr.edu) in the CNAS Graduate Student Affairs Center at this time.

At least one week before the Oral Qualifying Examination the chair of the committee will poll the committee members to determine if the quality of the submitted Research Proposal is of sufficient quality to allow the examination to proceed as scheduled. If there are concerns, then the chair will communicate these to the students and their Major Professor and they will reschedule the examination. The revised Research Proposal must then be resubmitted using the same schedule as described above. Students are only allowed one revision of the Research Proposal following which the Oral Exam will be held.

The Oral Examination

The Oral Examination must be held on a single day. All members of the Examination committee must be present for the entire exam. The student begins with a presentation of 45-60 minutes on his/her Dissertation Research Proposal. During and/or following the presentation, the committee asks the student questions about the research proposal and his/her dissertation research. The student should also be prepared to answer questions on broader topics in the field of cell, molecular, and developmental biology, especially if any particular area of concern arising from the Written Qualifying Examination has been identified by a member of the Oral Qualifying Examination Committee.

A "Pass" requires that no more than a single Committee member vote to fail. If a student fails the Oral Qualifying Examination, the Committee is required to make a recommendation either for or against a second examination. Ordinarily a second exam is not administered until at least three months have elapsed and within six months of the original exam. A third examination is not permitted. A student who does not pass the oral qualifying exam may be dismissed from the program or may be allowed to complete a M.S. degree. The CMDB Executive committee, in consultation with the student's Oral Qualifying Examination Committee, will determine if transfer to the M.S. program is recommended.

More information about the Graduate Council policies concerning Ph.D. Qualifying Examinations may be found in the Graduate Advisor's Handbook published on the Graduate Division website.

SATISFACTORY ACADEMIC PROGRESS

Normative time to the Ph.D. degree in Cell, Molecular and Developmental Biology is fifteen quarters (five years). Normative time is defined as the period of full-time registration required to earn the degree, assuming that the student enters with a bachelor's degree and has no course deficiencies or need to take any remedial work. As stated above, in the CMDB Program, the individual student's program of study is planned in consultation with his or her Guidance Committee, which supervises the student's progress prior to the appointment of the Dissertation Committee. After the student advances to candidacy, the Dissertation Committee oversees the student's progress in the final stages of his or her degree program.

For all students, evaluations of progress are carried out each spring. Students meet with their Guidance or Dissertation Committee and the student's Major Professor submits the Annual Research Progress Evaluation (ARPE). This process is critical for both the student and the Major Professor. Copies of every ARPE Committee Report are sent to Graduate Division as required by Graduate Council policy.

UNSATISFACTORY ACADEMIC PROGRESS

It is expected that students will make good progress in the CMDB degree program. The Graduate Division will block registration of students who fail to perform satisfactorily. In addition, unsatisfactory academic progress severely limits opportunities for receiving funding through the Program. Students are considered to be making unacceptable progress when:

- they fail to fulfill program requirements such as exams or research in a timely and satisfactory manner.
- the overall GPA drops below the minimum level of 3.50 for fellowship recipients, 3.00 for those holding TA appointments, or 3.00 for non-supported students;
- they have 12 or more units of "I" grades.
- the Major Professor feels that the student is not making normal progress in the laboratory.

TIME TABLE CHECKLIST FOR Ph.D. DEGREE

Name: _____ Quarter entered degree program:_____

Chair of Guidance Committee: _____

Members of Guidance Committee: _____

_____

	Target Date	Date Completed:
Year 1		
Meet with the Director and Graduate Advisor	1st quarter	_____
Do Rotations	1st – 2nd qtr	_____
Select Major Professor and establish Guidance Committee (Form available at http://cmdb.ucr.edu/current-students.html)	1st – 2nd qtr	_____
Meet with Guidance Committee (Annual Research Progress Evaluation)	Spring	_____
Year 2		
Nominate Oral Qualifying Exam Committee (Form available at http://cmdb.ucr.edu/current-students.html)	Fall or Winter Qtr.	_____
Research Proposal to Committee	Spring or Summer	_____
Take written qualifying exam	Spring or Summer	_____
*Take oral qualifying exam	Before the 7th quarter	_____
Meet with Guidance/Dissertation Committee (Annual Research Progress Evaluation)	Spring /Summer	_____
Year 3		
Meet with Guidance/Dissertation Committee (Annual Research Progress Evaluation)	Spring	_____

Year 4

Meet with Guidance/Dissertation Committee (Annual Research Progress Evaluation)	Spring	_____

Year 5

Write Dissertation	All quarters	_____
Meet with Guidance/Dissertation Committee (Annual Research Progress Evaluation)	Spring	_____
Publicly Defend Dissertation	Final Quarter	_____

IMPORTANT PROGRAM INFORMATION

The CMDB Graduate Student Association (CMDB-GSA): Every CMDB graduate student is automatically a member of the CMDB Graduate Student Association (CMDB-GSA). The CMDB-GSA serves several purposes, such as promoting interactions among the graduate students, providing information about the program and the university to the graduate students, and representing graduate student concerns to the faculty and other campus organizations. Students become better acquainted with each other and with the CMDB faculty during social events that the CMDB-GSA organizes. CMDB-GSA is governed by an elected student advisory committee, which is composed of one representative from the first year students, one from the second year students, and three from the students third year and up. One student from this committee serves as the chair, and acts as a liaison between the faculty and the graduate students, both by disseminating information to the students and by soliciting student opinions regarding programmatic issues and policies. The CMDB-GSA facilitates unified action of the graduate students regarding issues that affect them. Issues of interest to our students are discussed during meetings held at least once per quarter, and these concerns are brought to the faculty's attention when appropriate. The CMDB-GSA also sends representatives to Graduate Student Association (GSA) meetings, who then report back to the other members.

Keys: When you have selected a Major Professor, you will be able to obtain keys to access the building and rooms which you will be using. Your Major Professor will help you with this process.

Mailboxes: Graduate students are assigned mailboxes in their Major Professor's mailroom. If a student is rotating, their mailbox will be in the BNN Mailroom in Life Sciences by the second week of the fall term and will be moved once you settle in a lab. Please see the Student Affairs Officer in CNAS Grad Student Affairs to locate your mailbox. The mail is delivered twice a day, in the morning and afternoon. It is very important to check your box daily.

FINANCIAL SUPPORT

Students admitted to the Ph.D. typically receive financial support for 5 years. During the first year, the main sources of graduate student support are Fellowships and Graduate Student Research Assistantships obtained through the Program. After the first year, the majority of a student's financial support comes from Graduate Student Research Assistantships obtained through research grants awarded to the Major Professor and Teaching Assistantships. Students who enter the Ph.D. program with strong undergraduate records are encouraged to apply for National Science Foundation, Howard Hughes Medical Institute, or other extramural fellowships. Students who have Advanced to Candidacy are also encouraged to pursue extramural fellowship funding. Other support is available through a variety of University, State, and Federal sources.

Graduate Student Research Assistantships (GSRs): These positions are supported either with funds that come from the Program or from the Major Professor's grant. Students with GSRs receive a partial remission of fees and payment of the Graduate Student Health Insurance Program Fee.

Teaching Assistantships (TAs): The type of work involved in TAing varies according to the class assigned. When a student is appointed as a TA, they receive a detailed letter explaining the duties for the position. Students with Teaching Assistantships receive a partial remission of fees and payment of the Graduate Student Health Insurance Program Fee.

NOTE: TAs and GSRs must be making acceptable progress toward their degree objective, must be advanced to candidacy within 12 quarters after entry, and must have fewer than 8 units of Incomplete grades. In addition, TAs must maintain a 3.00 GPA; GSRs must maintain a 3.00 GPA.

Summer support: Students in the Program are normally supported by their Major Professor during the summer.

Graduate Research Mentoring Program and Dissertation Year Program Awards
The Graduate Research Mentoring Program (GRMP) award is intended to enhance the mentoring of domestic PhD students entering their 3rd, 4th, or 5th years of graduate school who are actively engaged in research. The Dissertation Year Program (DYP) Award is intended for MFA or PhD students who expect to complete their degree program the year in which the award is received. A single application may be used for both awards which provide stipends and cover fees from 1 to 3 quarters. Eligible students can receive up to three quarters each of the DYP and GRMP fellowships and may reapply if they have not reached this max. You can download the application from the web at http://graduate.ucr.edu/fin_aid.html

Graduate Student Association (GSA) Minigrants help to pay the travel expenses of students who have been invited to present scholarly papers or posters at regional and national professional conferences. The program is administered by the Graduate Student

Association and requires that Departments or Graduate Programs agree to provide matching funds. Contact the GSA, at x83740 or http://www.gsa.ucr.edu/, or the Graduate Student Affairs Officer for mini-grant applications.

EXTRAMURAL SUPPORT

In addition to the fellowships, assistantships, grants, and loans administered by the University, graduate students may also be eligible for other types of support provided by federal agencies and private foundations. Organizations that have awarded fellowships and research support to UCR students include the National Science Foundation, National Institutes of Health, U.S. Public Health Service, U.S. Department of Education, Fulbright Program, Phi Beta Kappa Alumni Scholarships for International Scholars, and Sigma Xi. If students wish to explore these sources of support for study, they should consult the *Annual Register of Grant Support* and other similar directories either at the reference department of the library or through the Financial Support section in the Graduate Division. There are also many sites on the Web devoted to various sources of aid for graduate students.