Guidelines for Ph.D. Qualifying Exam
Students of the Plant Biology Graduate Group (PBGG) are required to pass an oral qualifying examination before being advanced to candidacy for the Ph.D. in Plant Biology. The qualifying examination is to be held before the end of the seventh quarter in residence and after the student has completed all PBGG course requirements. The student’s Guidance Committee is responsible for deciding when the student is eligible and sufficiently prepared for the qualifying examination.

Purpose of the Qualifying Examination. The purpose of the exam is (1) to evaluate the breadth and depth of the student’s knowledge and understanding of Plant Biology, and (2) to assess the student’s intellectual capability and preparedness for conducting a productive thesis research, which should identify and address a significant question in Plant Biology and culminate in a dissertation of high quality.

Qualifying Examination Committee. Five faculty members of the PBGG constitute the Qualifying Examination Committee. Two committee members represent the student’s area of specialization, one of whom will normally serve as the chair of the Qualifying Examination Committee. The chair is expected to ensure that the student receives a fair examination. The student may suggest eligible members to serve on the Qualifying Examination Committee. The members are nominated by the Graduate Advisers Committee, which may choose other faculty of the PBGG as deemed appropriate. Committee members will be appointed by Graduate Studies in accordance with the Academic Senate regulations. The Qualifying Examination Committee may not include the major professor who will serve as chair of the student’s Dissertation Committee after advancement to candidacy.

Format of the Qualifying Examination. The Qualifying Examination will consist of three parts and will cover three of the four areas of specialization of the PBGG: (1) presentation and defense of the thesis research proposal, which will include a broader discussion of questions from the candidate’s area of specialization; (2) an oral examination of the candidate’s knowledge in general Plant Biology, which will be conducted at a level comparable to content and depth of the undergraduate preparation for the major and of the core course curriculum; and (3) a discussion of two topics from two areas in Plant Biology that will be selected by the student and will be different from the candidate’s own area of specialization. These two topics must be selected from a list of nine topics that are equivalent to the descriptors of the four major areas of specialization of the PBGG (underlined): (a) Cell and Developmental Biology; (b) Environmental and Integrative Plant Biology; (c) Molecular Biology, Biochemistry, and Genomics; (d) Systematics and Evolutionary Biology.

The candidate will be expected to distribute a written dissertation research proposal to the chair of the Qualifying Examination Committee at least two weeks prior to the oral examination. If necessary, the chair may make recommendations on improving the quality of the proposal before it will be distributed by the student to the other members of the committee at least one week prior to the examination. The student will prepare an oral presentation. In addition to the chalk/white board, the student may utilize visual aids to efficiently convey essential information as deemed necessary (limited to the display of information that is difficult to draw on the board). The
presentation should not exceed 20 min, excluding intermittent discussions. The exam may not last longer than 3 hours.

**Dissertation Research Proposal.** The purpose of the dissertation proposal is to concisely introduce, describe and justify the proposed thesis research. The scope and format of the proposal should be similar to that of a formal application for funding (e.g., application for a doctoral fellowship). The student is expected to show mastery in scientific writing, in the critical analysis of preliminary data, and in the synthesis of information derived from the relevant literature. The dissertation research proposal (single-spaced, 12 pts font size, 1 in. margins) should be organized into five sections and should not exceed 5 pages for sections 1-4, including figures.

1. **General objective and specific aims.** State briefly the overall objective of your dissertation research in its broad context and list the specific aims to achieve this goal. (less than half a page).
2. **Background and significance.** Describe the background and rationale for your thesis research. Critically evaluate the existing knowledge relevant to your research and identify an important question or unsolved problem that your thesis research will address in order to advance the field. State concisely the significance of the proposed research and relate the specific aims to the long-term objective. (approx. one page).
3. **Preliminary data.** Briefly describe research that has been conducted and that is relevant to the proposal. Clearly state your contributions to this research (approx. one page).
4. **Experimental plan and research methods.** Outline the experimental design and the procedures to be used to accomplish the specific aims of your thesis research. Include the means by which data will be collected, analyzed and interpreted. Discuss the potential difficulties and limitations of the proposed procedures as well as alternative approaches to achieve the major objective. Provide a tentative timetable of your research. (two to three pages).
5. **References.** Consult a major journal in the field of plant biology and follow its style of citation. Each citation must include the names of all authors, title of the article, name of the journal or book, volume number, page numbers, and year of publication. (no more than two pages or 25 references).

**Qualifying Examination Evaluations.** PBGG students are strongly advised to meet with committee members to discuss their expectations for the Qualifying Examination. There are three possible outcomes: pass, not pass, and fail. **Pass** advances the student to candidacy for the Ph.D. **Fail** means that the student is disqualified. **Not pass** means that the student is required to retake all or part of the examination or to satisfy another requirement (e.g., take a specific class, assist a specific class as a TA, etc.). If requested, the second examination is to be scheduled at the earliest possible date deemed to be appropriate by the committee. The second examination will be administered by the same Qualifying Committee. Only two outcomes are possible for the second examination: **pass or fail.** The Qualifying Committee should make every effort to reach a unanimous decision. Split decision will be referred to Graduate Studies for a final decision.
Qualifying Exams

Policy and procedures on the assignment of Ph.D. qualifying examination committees in the Plant Biology Graduate Group:

1. Each Ph.D. student is expected to have taken and passed the qualifying examination before the end of the fall quarter of his or her third year. Any student who has not been advanced to candidacy by the end of fall quarter of the third year of graduate study will not be eligible for support from PBGG funds until such time as the qualifying examination has been successfully completed.

2. A qualifying examination committee will be assigned for each Ph.D. student during the winter quarter of the second year of graduate study. All qualifying examination committee assignments for that year’s cohort of second-year students will be formulated at an annual, winter-quarter meeting of all PBGG academic advisers, chaired by the Master Adviser. The Master Adviser will forward recommendations for qualifying examination committee assignments to the PBGG Executive Committee for approval as required by the by-laws. It is expected that Executive Committee approval will be routine.

3. Second-year students should consult with their academic advisers and designated major professor prior to the winter quarter advisers’ meeting, preferably during fall quarter. The student, adviser, and major professor will formulate suggestions for a five-member qualifying examination committee and a list of up to five alternate members. The advisers’ committee may consider the suggested member, but is not bound by them.

4. In formulating their recommendations, the academic advisers will consider carefully each individual student’s interests, background and research goals. In addition, they will consider the need to balance the qualifying examination committee workload among the group faculty in an equitable manner.

5. Students will be informed of their qualifying examination committees before the end of the winter quarter. A student may request a change of any one member of the qualifying examination committee without being required or expected to provide justification for the change. In such cases, the Master Adviser will recommend a replacement member to the Executive Committee. In the event that a student seeks to change more than one committee member, the student will prepare a written request to the Chair of the group providing reasons for all requested changes. Student-initiated requests for changes in the qualifying examination committee must be submitted within ten days of the announcement of committee assignments. The Master Adviser and the Executive Committee will consider such requests, and may approve those that demonstrate strong and compelling justification for change. The Executive Committee will not consider student requests or recommendations for specific replacement committee members.

6. Although it is the policy of PBGG and the Division of Graduate Studies that students are only admitted to graduate study beginning in the Fall Quarter, rare exceptions are sometimes made. Qualifying examination committee assignments for a student who matriculates in winter or spring quarter will be put on the agenda of the most appropriate annual advisers’ meeting as determined by the master adviser in consultation with the student’s academic adviser. All students are expected to be advance to candidacy by the end of their seventh quarter of graduate study.

7. Students who enter the Plant Biology Graduate Group as Master’s candidates and are admitted to the Ph.D. program after completing a Master’s degree will be assigned a qualifying examination committee at the first annual meeting of advisers following completion of the Master’s degree. Such students are expected to be advance to candidacy no later than the fall quarter of their fourth year of graduate study.
The Qualifying Examination, A Guide by Mark Havrilla-Ainsworth (Ph.D., 2000):

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I. Introduction:
Whether you are preparing for an examination to complete the work for your Master’s degree or are attempting to advance to candidacy within the Ph.D. program, the qualifying examination is an excellent opportunity to pull together and organize the significant amount of information you’ve picked up thus far. The qualifying exam (for the remainder of this document “qualifying exam” will be referred to as the more well known term “Orals”) is generally a comprehensive exam that is given orally by 3 (for Master’s) or 5 graduate group professors (Ph.D.). The exam for advancement to candidacy consists of a presentation of a thesis proposal followed by examination in 4 separate topics. Orals can last from 2.5 to 3 hours. One should look upon this experience with a positive attitude and anticipate it with excitement. With the proper preparation and a bit of luck, you’ll look back upon your orals with fond memories.

II. Logistics
A. Submitting Committee Suggestions:
In the Plant Biology Graduate Group, students do not pick their qualifying exam committee members. Students do submit requests as to whom they would like to have on their committee, but ultimately final assignments are handed down from “above”. This happens during your second year in the graduate group.

The form for committee suggestion (Oral Exam Nomination Form) can be downloaded at PBGG website http://biosci2.ucdavis.edu/ggc/pbgg/people/currentstudents.html. The completion of the form will require the contemplation of several factors - who you want to suggest and what categories in which you would like to be held responsible.

There are a couple of things you can do to help with the first of these requirements. The best thing to do concerning committee members is talk to more senior graduate students who have already taken the exam. Find out who was on their committee and whether or not that person might be right for your committee as well. Consider the courses that you’ve taken or for which you’ve been a TA and your impressions of the potential committee members from those experiences. Throughout this entire experience, don’t forget that your PI can be a good source of information, having not only gone through this experience but having sat on the “other side of the table” as well. A final note when considering committee members: a historically CHALLENGING member is not a problem, while a historically UNPREDICTABLE member can be considerably more detrimental.

CHECK LIST: COMMITTEE SUGGESTIONS
1) Download a nomination form at http://biosci2.ucdavis.edu/ggc/pbgg/people/currentstudents.html
2) Talk to more senior graduate students for suggestions
3) Consider faculty you know personally (TAing for classes)
4) Talk with your PI about your choices
5) Talk to your Academic Adviser, who needs to sign the form
6) Fill in the sheet and turn it into Master Adviser before the due date (during Winter Qtr. of your second year).
B. Getting Assigned a Committee: By turning in your Qualifying Exam Committee “suggestion” form, the graduate group will let you know your potential committee sometime during Winter Quarter of your second year. The only thing you can do at this time is to determine if there is an individual on your committee that is unacceptable. If that is the case, you can talk with your academic adviser (or the PBGG office) to get the gears in motion to get one new committee member.

Once you have the members of your committee, you can go ahead and get them organized. Your committee assignment will also assign the individual members to their respective categories for your exam, as well as your Chairperson. The Chairperson is who you want to get in touch with first.

C. Organizing Your Committee and Getting a Date: E-mail your chairperson and set up a brief meeting. It is your responsibility to organize your committee such that all six of you can meet at one time in one place in the near future for your exam. If there is time pressure for you to complete the exam, you should begin as soon as possible to ensure it is accomplished in a timely manner. You’ll have to discuss when you feel would be the appropriate time to take the exam, i.e. Spring Qtr., sometime in the summer, early or late in the Fall Qtr. And if you’re a morning person, express that you prefer to take the exam in the morning.

In general, you’ll want to meet with each of your committee members at least once, very early on. Send out a general e-mail to your entire committee letting them know that they are on your committee, and that you’ll be contacting each individually to discuss what’s expected of you. Then do just that!! Talk to each member and ask what they will expect from you as well as any general advice they could give you on this experience. They have gone through it, take advantage of their experience as well. Some faculty members will offer to meet with you periodically during the preparation period, and if such an offer is made - take it! But do not take the offer lightly, if a faculty member is willing to spend extra time with you to help you prepare for the exam, prepare for each meeting with that individual appropriately. In general, such an offer will not be made, but a more general “If you have any questions, let me know” seems to be a common event. Don’t be afraid to take advantage of this offer either.

The bottom line to passing the exam is whether or not the faculty feels that you are competent and possess sufficient knowledge. The more time you spend with your committee members before (hopefully showing your eagerness to learn and think, and showing how much you have learned!!!) The less you’ll have to “prove” during the actual exam.

III. Preparation (general guideline):

Time Table: Once you’ve determined when you want to take the exam, build yourself a timetable between now and then for studying. Again, this is another area that is personal, but in general if you take 6-8 weeks total for preparation, you will be MORE than ready for the exam. Those 6-8 weeks should be broken down into 3-4 weeks part-time reading (evenings, 1-2 hours a day; you’ll be amazed how much you can get through in that amount of time) and the final 2-4 weeks for full-time studying. The time you take to study is an important decision. One can view the strategy for preparation as a parallel to the strategy for running a road race. In the beginning, you need to pick up speed and warm up your muscles slowly, otherwise you could pull something. Likewise, in the end, if you start sprinting too early (you’ll burn out and have a horrible finish) or too late (you won’t finish in time) an equally detrimental consequence is incurred.

For example, a student starts reading in the evenings in preparation 6 weeks before his/her exam. This is a good time for reading/reviewing suggested text books and TAKING NOTES! Don’t just read the book thinking that’s all you need. TAKE NOTES. Writing it down helps you remember it and your notes will become pivotal for your success during the final week of preparation. This is also a good time to talk with your PI and see if you can get time off from research in the upcoming weeks as you move into full-time
studying. If you’re TAing, plan appropriately and maybe give yourself a full 4 weeks out of the research scene.

When you’ve filled your schedule with nothing but studying time, stop, and go back and erase a couple of hours of time every day. Take these couple of hours each day and break them up into study breaks. SCHEDULE THEM!! And do not take them if you haven’t earned them by making a concerted effort to read. By scheduling breaks for exercise or free time, you’ll be more apt to work through the material because you’ll have something to look forward to in a few hours. It also gives your brain a chance to rest and absorb what you’ve been reading. This again is a personal thing, but the point is to find a daily schedule that is PRODUCTIVE!

As the weeks move on, finish any needed textbook reading and start reviewing from your previous notes and class notes. This review of notes only should comprise the last week of your studying. If you’ve seen everything only once, you may have a difficult time, but by taking this week to review, it will really cement things in your head. During this time it is also very important to practice and polish your presentation.

Proposal: During “full-time study” start going back to primary literature, review articles and specific class notes concerning your proposal. You’ll want to get that written (at least a rough draft) the first thing into your full-time studying period, if not before. This will provide you with ample time to read and build the knowledge base to defend your proposal. Spend some time and a number of revisions on your proposal; it is your opportunity to display your writing skills and present a logical approach to answering a scientific question. Follow the requirement of the proposal (page length, format, etc; see page 2 of this document). Faculty members have a considerable amount to do, and the less they have to read the better. Keep in mind the areas that may be covered in a cursory manner in your proposal because these will likely be points for questions during the exam:

Once you’ve had input from your PI and friends on your proposal, get a final draft together and get copies to the chairperson at least two weeks prior to the exam, then to your committee members at least a week before your exam (see some details in page 2 of this document). It’s a good idea at this time to e-mail your committee, providing a polite reminder that your exam is in about a week, and that you’ll be getting them a copy of your proposal. You should PERSONALLY HAND a copy to each committee member if at all possible. This gives them the opportunity to see your face again (which they may not have seen in several weeks or months) and provide reinforcement to the reminder that the exam is WHERE and WHEN, NEXT WEEK!!

Mock Orals: Mock orals are one of the best ways to study. Plan to do this at least twice, once at the beginning of your studying and once about 1 or 2 weeks before your exam. Talk with more senior graduate students, students of your committee members, or people with expertise in the fields which individuals on your committee study, and ask them to participate. Specifically, ask people, if they know your committee members, to “role-play” and act as they think, or KNOW, an individual on your committee would. The initial mock orals should provide you with where the gaps in your knowledge are, and the second should be about what things you need to fine-tune before your exam. Also, the second mock orals should include your thesis proposal presentation. If at all possible, try to do mock orals in the same room in which you’re going to have your real orals. This will give you the opportunity to get a feel for the physical conditions in which you’ll be asked questions, as well as using the board (chalk or marker). Orals can be viewed as testing two things: 1) your factual knowledge and it’s implementation; 2) your ability to think on your feet and maintain emotional stability even when you don’t know the answer. Mock oral sessions are your time to develop the latter of these skills. Have your participators push you to a point where you must say that you don’t know the answer. It will make you a little uncomfortable and frustrated, but that’s to be expected. What you do with those emotions and feelings is that on which what

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MUST be worked. Your committee WILL push you to a point where you don’t know the answer. That OK! It’s how long it took you to get there, and how you think that will be judged. It is essential that you DO NOT become flustered when this happens. That is what mock orals are all about.

**Final days:** To reiterate, clear thinking and problem solving are as much a part of this exam as the factual knowledge. Therefore it is VERY important that you take at least the day before if not the TWO days before your exam off! Participate in activities that relax you; take naps, exercise, watch movies, etc. Only if you’re well rested and relaxed on the day of your exam will you have a chance to recall the information you’ve learned.

During these last few days and the week before, you will be put to the true test of what orals are about. Trust yourself and do not panic. You will go through periods of intense anxiety in those weeks just prior to the exam. They will come and go, and it is up to you to get a grip on them. Again, you MUST learn to trust yourself, your education, and your abilities. Remember, no one in the exam room will know your particular field as well as you. No one can know everything, but you must keep that in mind during this time.

**Checklist: Preparation**

1) Meet with all your committee members and determine what they expect of you (KEEP NOTES)
2) Make a game plan for the time you have before the exam and talk to your PI about taking some time off from research
3) Implement your plan by starting with the basics a couple of hours a day (TAKE NOTES)
4) MOCK ORAL I
5) Move into full-time studying, but stay active by having organized breaks. Hit the primary literature and write your proposal first
6) MOCK ORALS II (including your presentation)
7) Move into the last phase of studying by reviewing old class notes and the notes from your reading. Start this no later than one week before the exam
8) Provide a copy of your thesis proposal to all your committee members (about one week before the exam)
9) Two days before the exam, stop or at least start winding things down. An absolute must is the cessation of studying the day before. RELAX.

**IV. Taking the Exam:** When the fated day finally arrives, you will be ready!! Sleep in if you can, and try not to be anxious. You’ll want to wear something nice. You want to convey the impression that you’re taking this seriously. Though this is an event that you’ve been preparing for, and has been consuming your thoughts for several weeks, the faculty on your committee do this quite often, and probably didn’t even consider your proposal but a few days before.

Before the exam, make sure that you have enough chalk or markers that work, and that all the AV equipment is working for your presentation. You’ll want to bring a bottle of water or juice because you’re going to be talking for several hours.

When all five committee members have arrived, they will ask you to step out for a few minutes while they get organized. When they call you back into the room, it will begin. Start the examination with a 2 minute personal introduction. You’ll want to include your educational background, why you study plant biology, and what your career goals include. This will break the ice, and give you the opportunity to talk about something, which you know a considerable amount - YOURSELF!! Then you should move smoothly into something about which you know nearly as much - your thesis proposal. It is IMPERATIVE that you’ve polished your presentation to a point where it simply glows!! It is the beginning of the exam and your committee’s first impressions of you during this event. This is a topic that you will know more about than
any one of your committee members. It will build your confidence and it will truly set the tone for the entire exam. Your committee may or may not interrupt you during your presentation - be prepared for either situation.

After your presentation, the individuals of your committee will question you in each of their respective categories. Often you’ll be able to dictate the order, and if you proceed in an order of decreasing knowledge, you’ll be able to build more momentum at the beginning of the exam that will carry you through some rough spots.

When answering questions, a couple of things should be kept in mind. One, always make sure that you understand what is being asked of you, i.e. ask questions of your committee to clarify! This will also provide you with an opportunity to show what you know even if you can’t answer the question asked. For example, if a question concerning X is asked, you could respond with related topics such as, “Do you mean A, B, or C in relation to X?” The second thing to keep in mind while answering questions is to never answer right away, even if you know the answer. ALWAYS: pause, take a breath, turn to the board (even if you don’t need it) and write something down, before answering the question. The pause and breath gives you the opportunity to recall the necessary information, or at least begin to process the question, and relaxes you a bit. Turning to the board helps to shut out the committee and bring you to a state where it’s just you and the board, reducing the pressure on you.

As a final note concerning your influence on the exam atmosphere - do not seem too self-assured. ALWAYS maintain the proper deference for your committee members and never sound arrogant. Keep in mind that if they really wanted to, each one of your members individually could intellectually CRUSH YOU, and make you look like a FOOL! Pay them the proper respect.

Check list: Taking the Exam
1) Make sure the exam room and any A/V equipment is in the proper working order
2) Enter the exam dressed appropriately, and bring water or juice
3) Start with a short, personal introduction
4) Move into an award-winning delivery of your thesis proposal presentation
5) When answering questions, remember to pause, breath, and write on the board
6) Maintain a proper demeanor of deference
7) Don’t panic when you can’t answer a question, move on and put it behind you
8) Enjoy yourself!!

Final Notes: Orals are a right of passage. They should be a time to pull things together like never before and hence should be an enlightening and ENJOYABLE experience. Try to keep that in mind during the entire preparation and actual exam. It is an emotionally trying time though as well, and pull on support from friends and family get you through it -especially people that have gone through it will understand your situation, though you will not see that until after the fact.

The author hopes that this composition has been helpful. GOOD LUCK!!!!!!!