2024-2025 Intercollege Graduate Degree Program in Plant Biology Student and Faculty Handbook

https://www.huck.psu.edu/graduate-programs/plant-biology

SECTION II - GENERAL REQUIREMENTS FOR ALL PLANT BIOLOGY PROGRAM DEGREE STUDENTS

SECTION III - THE PH.D. DEGREE IN PLANT BIOLOGY

Preface

This Handbook has been compiled to assist graduate students and faculty in the Intercollege Graduate Degree Program in Plant Biology. (Hereafter, the program will be referred to as the Plant Biology Program or as the Program.) It contains the advanced degree requirements and other information pertinent to the Program. Other statements of Program policy and general information are also included. In many cases, the degree requirements given are specific to the Graduate Degree Program in Plant Biology. The Graduate Bulletin, Graduate Student Life, and Thesis and Dissertation Guide may be consulted for additional University policies and requirements.

The University

The Pennsylvania State University had its beginning in 1855 as the Farmers' High School. From this beginning Penn State has become a multi-campus university of over 87,903 students. Approximately 42,223 students, including about 6,312 graduate students, are on the University Park campus. Penn State is Pennsylvania's Land-Grant University. Faculty and students in the Plant Biology Program are all located on the University Park campus.

Program Overview

The Plant Biology Program at Penn State was established as the Intercollege Graduate Degree Program (IGDP) in Plant Physiology in 1983. The Program provides a better educational and research experience for students interested in diverse biological problems in plants than would be possible in the departments of individual faculty advisors. This is accomplished through enhanced faculty cooperation and direct student interactions with several faculty members other than the dissertation or thesis advisors. As the field of plant research has significantly expanded since the establishment of the Program, the name of the Program was changed to its current name in July 2006 to better reflect the diverse research areas and graduate training opportunities offered by the Program faculty. Also, as part of the re-organization of all intercollege graduate degree programs in life sciences at Penn State, the Ecological and Molecular Plant Physiology (EMPP) option of the Integrative Biosciences (IBIOS) Graduate Program was merged with the Plant Biology Program in Spring 2006. The Huck Institutes of the Life Sciences (https://www.huck.psu.edu) is the administrative home of the Program and the J. Jeffrey and Ann Marie Fox Graduate School at Penn State (https://gradschool.psu.edu; hereafter referred to as the Fox Graduate School) is the academic home of the Program.

The Plant Biology Program offers graduate work leading to the Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees. It is designed to provide education and research experience in advanced plant biology to prepare qualified students for teaching and research positions in colleges and universities, and for research and other science-based positions in industry and government.

The Plant Biology Program brings together faculty from the departments of Agricultural and Biological Engineering, Biochemistry and Molecular Biology, Biology, Chemical Engineering, Chemistry, Ecosystem Science and Management, Entomology, Food Science, Plant Pathology and Environmental Microbiology, Plant Science, and Veterinary and Biomedical Sciences. These 11 departments are from three colleges, the College of Agricultural Sciences, the Eberly College of Science, and the College of Engineering. Faculty members have diverse expertise to prepare students in almost all sub-fields of plant biology, from the cellular, molecular and

biochemical levels to the whole plant level. (See https://www.huck.psu.edu/graduate-programs/plant-biology/people/faculty for the current Program faculty members and their research areas.) Admission of new faculty members is an ongoing process. A faculty member whose research is in the area of plant-related life sciences may apply for admission to the Plant Biology Faculty by submitting their C.V. and letter of interest to the Chair of the Program. The Chair may consult with an *ad hoc* committee for initial review. If the applicant is deemed worthy of further consideration, the Chair will send out a ballot, along with the candidate's C.V. and letter of interest, to all current faculty members for voting on the candidacy of the applicant, based on their scientific background and fit for the Program. For a candidate to be admitted to the Plant Biology Graduate Faculty, completed ballots must be received from at least 2/3 of the current Plant Biology faculty, and at least 2/3 of the ballots returned must approve admission. If the candidate is not already on the Graduate Faculty of their home department, they cannot be formally admitted until they are.

The Plant Biology Program provides one full year (Fall and Spring Semesters plus the Summer prior to Year 2) of financial support to all first-year students in the Ph.D. degree program. (See Section I for financial support in subsequent years of study.) Ph.D. students are required to conduct lab rotations to explore potential dissertation projects and faculty advisors.

After Ph.D. students have chosen their dissertation advisors (typically before the end of the Fall Semester or Spring Semester of Year 1), each student will become associated with the advisor's academic department. The advisor's department provides research facilities and office space, and may also provide financial support, usually in the form of a research assistantship or a teaching assistantship.

Work for an M.S. degree in Plant Biology is usually completed in two years and students must complete an M.S. thesis based on their research. The Ph.D. degree in Plant Biology requires three or more years of study and research beyond the M.S. level.

After Ph.D. and M.S. degree students become associated with their faculty advisor's home department, they should continue to use the formal name of the Program, Intercollege Graduate Degree Program (IGDP) in Plant Biology, as their graduate program affiliation in posters and publications. They may use the abbreviated name, Plant Biology (Graduate) Program, on unofficial occasions.

There are two 4-credit advanced plant biology courses that are required for all students. These courses, titled "Plant Resource Acquisition and Utilization" (PLBIO 512) and "Integrative Plant Communication and Growth" (PLBIO 513), are team-taught by the Program faculty and are designed to cover the breadth of modern plant biology. Students are introduced to faculty research and develop skills in problem solving. Students enrolled in the Ph.D. degree program are required to take three 2-credit laboratory intensive modules designed to introduce them to modern techniques and theories used to solve problems in three research areas: ecophysiology (PLBIO 514), plant cell biology (PLBIO 515), and plant molecular biology (PLBIO 516). Please note that PLBIO 514 was not offered in 2022-2023 and 2023-2024, and will not be offered in 2024-2025. Ph.D. students matriculating in Fall 2022, Fall 2023, and Fall 2024 are not required to take this course. Additional required courses for M.S. students are described in Section II, and for Ph.D. students are described in Sections II and III.

The Plant Biology Program organizes and hosts a weekly seminar series during the academic year. Presentations are made by Penn State faculty members from both inside and outside the Program, Plant Biology students, postdoctoral scholars, and invited scientists from outside Penn State. Student-invited seminars were incorporated into the Plant Biology Seminar series in Spring 2001. Each semester, the students collectively choose a guest speaker to come to campus

and give a presentation. The students host the visit of the speaker. In addition, the Distinguished Lecture in Plant Biology series was inaugurated in Spring 2011. It is sponsored by the Huck Institutes of the Life Sciences and hosted by the Plant Biology Program. One distinguished speaker is invited in each semester. Information about the current and past seminar series (dating back to Spring 2000) is available at the Plant Biology Program website, https://www.huck.psu.edu/graduate-programs/plant-biology/seminars.

The Plant Biology Program has been hosting the Penn State Symposium in Plant Biology since 1986. This three-day symposium is one of very few international symposia in plant biology that are organized entirely by the faculty of a single graduate program. The theme of the symposium changes each time and attracts outstanding speakers and participants from the United States and the world. The special focus on diverse topics attracts many people who would not otherwise attend the same meeting, because of their wide-ranging specialties. The most recent Plant Biology Symposium (the 23rd) was held June 18-20, 2022 on the theme of RNA Biology. For the topics of all previous symposia, visit the Plant Biology Program website, https://www.huck.psu.edu/graduate-programs/plant-biology/symposia.

Research Facilities

Because the Plant Biology Program brings together faculty from 11 different academic departments, a wide array of modern scientific equipment is at our disposal. This includes facilities for all components of plant research, from fields and greenhouses to modern, well-equipped research laboratories.

Furthermore, since the Plant Biology Program is administered by the Huck Institutes of the Life Sciences, this association provides a number of core user services, such as the Genomics Core Facility, the Metabolomics Core Facility, Microscopy Core Facility, and the X-Ray Crystallography Facility (See https://www.huck.psu.edu/core-facilities for a complete list.) These facilities are available for student use on a fee-for-service basis. Students should discuss their needs for use of these services with their dissertation or thesis advisors.

About This Handbook

This Handbook constitutes the policies, procedures and requirements that govern specific details for the student's course of study in the Plant Biology Program. Along with the Graduate Bulletin and Graduate Education Policies, it should be frequently consulted for all appropriate information during the course of a student's studies. While the Program will make every attempt to assist students, the ultimate responsibility for ensuring that all the requirements for completing a degree have been met rests with the student.

The Program Chair, after consultation with the Huck Graduate Programs Office and Program Faculty, reserves the right to amend or change the policies, procedures and requirements outlined in this Handbook to further the growth and improvement of the Plant Biology Program. The Program Chair, with the assistance of the Huck Graduate Programs Office, updates the Handbook each summer to also incorporate new changes in policies, procedures, and requirements implemented by the Fox Graduate School and/or Huck Institutes of the Life Sciences. Students who are already enrolled must use the latest edition of the Handbook to be in compliance with new policies, procedures, and requirements.

The current 2024-2025 edition of the Handbook, along with previous editions, is available online at https://www.huck.psu.edu/graduate-programs/plant-biology/student-resources/degree-requirements

Other Resources

As previously mentioned, the Graduate Bulletin, Graduate Education Policies, and Thesis and Dissertation Guide must be consulted for additional information on University policies and requirements, and for a more detailed look at some topics that are mentioned in this Handbook. This Handbook does not attempt to duplicate or replace these other documents where similar information is covered in full. In addition, the Fox Graduate School and the Graduate and Professional Student Association (GPSA) provide useful resources for graduate students to utilize during their pursuit of graduate degrees. To access these resources, please follow the instructions given below.

Graduate Bulletin

The Bulletin contains general information about graduate study at Penn State (student services, graduate life, academic information, graduate degree requirements, etc.), as well as specific information about individual graduate programs at Penn State (degrees conferred, graduate faculty, degree requirements, courses offered, etc.).

The Bulletin is updated frequently, and only the current edition is posted at

https://bulletins.psu.edu/graduate/.

Graduate Education Policies

University Policies regarding graduate education are posted on the Fox Graduate School's website: http://gradschool.psu.edu/graduate-education-policies/. Detailed information about degree requirements, enrollment requirements, Ph.D. and M.S. committee membership, student conduct and many other details are covered in these policies.

Graduate Student Life

The Fox Graduate School and GPSA (315 HUB-Robeson Center) provide helpful information about campus and community resources for graduate students, available at https://gradschool.psu.edu/graduate-student-life/ and http://gpsa.psu.edu/resources-common-links/links-to-student-resources/, respectively.

Thesis and Dissertation Guide

The Thesis and Dissertation Guide is published by the Office of Theses and Dissertations (115 Kern Building), and it contains the technical requirements, as well as detailed instructions for preparation and the procedures for submission of M.S. theses and Ph.D. dissertations. The guide is available as a pdf file at https://gradschool.psu.edu/assets/uploads/documents/Thesis-and-Dissertation-Handbook.pdf.

Graduate Writing Center

The Graduate Writing Center, https://gwc.psu.edu, is open year-round to provide free individual consultation for graduate students to discuss their writing with a peer writing consultant. Consultations aim to help students improve both their writing and critical thinking skills.

Students working on any writing project from any graduate discipline are encouraged to schedule an appointment in-person or via Zoom at https://secure.gradsch.psu.edu/wccal/. For questions and/or additional information about Writing Center services, please visit https://gwc.psu.edu/contact-us/.

Career and Professional Development

The Huck Institutes of the Life Sciences provides graduate students with the resources necessary to be successful in obtaining and securing satisfying and rewarding careers, no matter what career paths they choose. For details, see https://www.huck.psu.edu/resources/students/graduate-students/professional-development/professional-development-overview.

SECTION I: POLICIES AND PROGRAM INFORMATION

Admission Procedures and Requirements

Before being offered admission to the M.S. or Ph.D. degree program, applicants must be evaluated and recommended for admission by the Program's Graduate Admissions Committee, with additional input from the rest of the Program Faculty. Decisions on admission are based on previous academic records and research experience, letters of reference, written statement of purpose, and in-person or virtual interview with the Program. All international applicants must submit TOEFL or IELTS scores, with the exception of those who have received baccalaureate or M.S. degrees from institutions in specified countries noted on the Fox Graduate School's website, https://gradschool.psu.edu/admissions/prepare-to-apply - Minimum-Requirements-200174. To be considered for admission, the Fox Graduate School and the Plant Biology Program require a minimum TOEFL score of 80 on the Internet-based test (IBT), with a minimum score of 19 on the speaking skills component. The minimum acceptable score on the IELTS test is 6.5.

When entering the Plant Biology Program, a student may choose one of three paths:

- The student may work toward an M.S. as a terminal degree.
- The student may work through an M.S. to a Ph.D. degree.
- The student may enter directly into the Ph.D. degree program.

B.S. level applicants who have good academic records and have had strong training in plant biology and related courses, including research experience, are strongly encouraged to apply for admission directly into the Ph.D. degree program.

Provisional Admission and Admission Deficiencies

In addition to having taken plant biology-related courses, students entering the Plant Biology Program should have adequate course preparation in the physical and biological sciences, e.g., general chemistry, organic chemistry, general physics, genetics, biochemistry, and microbiology. An applicant may be granted provisional admission status, if they are excellent in all other regards but lack certain course work deemed necessary to achieve success in the Program. However, it should be noted that, as each year the number of qualified applicants is greater than the number of students who can be admitted, it is unlikely that an applicant deemed deficient in certain necessary background will be considered for admission.

Financial Considerations

The Plant Biology Program has no separate application for financial aid. All applicants for the Ph.D. degree program are automatically considered for financial support. Applicants for the M.S. degree program will normally be admitted only if they are able to fund their study with personal funds, through external scholarships, and/or from other sources.

All students accepted into the Ph.D. degree program are guaranteed financial support (stipend plus full tuition grant-in-aid) throughout their tenure, provided that they remain in good academic standing and maintain satisfactory performance.

The sources of funding for Ph.D. students include competitive University Graduate Fellowship (Year 1 only) and Huck Distinguished Graduate Fellowship (Year 1 only), Huck research assistantships (Year 1 only), training grants and fellowships from outside funding agencies,

faculty advisors' research grants, teaching assistantships from the departments with which faculty advisors are affiliated, and Plant Biology research assistantships.

Research Assistantships

In each academic year, the Fox Graduate School provides the Program a certain number of research assistantships, each of which carries a stipend and full tuition grant-in-aid. The Program Chair administers these assistantships, which are awarded to continuing Ph.D. students during academic semesters (excluding summer sessions) on the basis of academic record, individual merit, specific needs, and the availability of other funding sources.

In general, the research assistantships are granted for one semester at a time. To retain an assistantship, students must maintain a B (3.0) grade-point average and be registered for at least 9 credits if they have not passed the comprehensive exam, or be registered for Ph.D. Dissertation (0 credit) if they have passed the comprehensive exam. If courses are dropped and the total credits fall below the minimum, or if students are deemed to not be making satisfactory progress in dissertation research, unspent assistantship stipends will be forfeited for the remainder of the semester.

The Huck Institutes of the Life Sciences provides the Program funds for graduate stipends (including both academic semesters and summer sessions) and tuition grants-in-aid. These are normally awarded to first-year students in the Ph.D. degree program during recruiting.

Other research assistantships may be available directly from the Plant Biology Faculty members or from their academic departments.

Graduate Fellowships

The Fox Graduate School fellowships (University Graduate Fellowship and Eva J. Pell Distinguished Graduate Fellowship) and Huck Distinguished Graduate Fellowship are awarded to first-year students on a competitive basis. Each fellowship also carries a full tuition grant-in-aid. Bunton-Waller Graduate Assistantship is awarded to first-year students in underrepresented minority groups on a competitive basis. The Program Chair, in consultation with the Graduate Admissions Committee, nominates prospective students for these Graduate Fellowships and the Bunton-Waller Graduate Assistantship during the recruiting process.

Professional societies and other external agencies award other fellowships. Information on the availability of these fellowships is available from the student's advisor or the Program Chair.

Teaching Assistantships

The Plant Biology Program does not have a teaching requirement, but strongly encourages students to acquire teaching expeience after completing all required courses in Year 1 of their study. Some academic departments provide teaching assistantships to Plant Biology students through their dissertation advisors. Students should contact their dissertation advisors for information on the availability of a departmental teaching assistantship.

Supplemental Recruitment Funds

The Fox Graduate School provides Graham Endowed Fellowships and the Jack C. and Barbara M. Shannon Graduate Scholarship, on a competitive basis, to supplement research assistantships and fellowships awarded to incoming students of superior quality. The Eberly College of Science provides Braddock/Roberts Scholarships to supplement research assistantships and fellowships awarded to incoming students who are likely to pursue their Ph.D. dissertation research with Plant Biology faculty members who are members of the College. For all these supplemental funds, the Program Chair, in consultation with the Graduate Admissions Committee, nominates prospective students during recruiting.

The Plant Biology Program Office

The Plant Biology Program, along with five other Intercollege Graduate Degree Programs (IGDPs) in life sciences, is housed under the Huck Institutes of the Life Sciences (for a complete list of the Huck graduate programs see https://www.huck.psu.edu/graduate-programs). The Huck Institutes foster an interdisciplinary, innovative, collaborative approach to research by offering cutting-edge life sciences research with more than 300 faculty participants from both University Park and Hershey campuses representing a wide range of institutes, centers, and graduate programs. The staff of the Huck Institutes assists the Program Chair with all Program affairs and activities. The Huck Graduate Programs Office is located in 101 Huck Life Sciences Building, and the office hours are 8:00 a.m. – 5:00 p.m. Under the current hybrid work schedule, each staff member works two days in the office and three days remotely, and there is at least one staff member working in the office every day of the week. Freya Heryla is the contact person for the Plant Biology Program; her email address is fqh5144@psu.edu and phone number is 814-863-3273. Throughout the remainder of the Handbook, when students are asked to contact the Huck Graduate Programs Office, this means contacting Freya Heryla.

In 1997, the Fox Graduate School decentralized the many administrative functions performed by the Fox Graduate School office staff. This change shifted the responsibility for admissions and other administrative tasks to the individual programs or departments, allowing students to work through just one office for most situations when administrative help is needed.

The Huck Graduate Programs Office offers a wide variety of assistance and support to both students and faculty. If you need help with registration, scheduling courses, adding or dropping courses, grades or transcripts, please feel free to contact the Office personnel. You will also need to contact the Office when it is time to appoint your dissertation/thesis committee, schedule your qualifying, comprehensive, and final oral exams and arrange for graduation. It will be important to work closely with the Office during each phase of your study to assure that all flows smoothly.

Registration

Pre-registration and Required Credit Loads

Students are strongly encouraged to pre-register for the upcoming semester. Pre-registration allows reasonable enrollment estimates to be made and helps prevent course cancellations. The Registrar's Office publishes the dates after which students may begin to register for the next semester. The exact dates vary by semester, but generally fall about midway through the current semester. Students should plan their academic schedules in consultation with their dissertation or thesis advisors.

A student who is enrolled for 9 credits or above (but not exceeding 12 credits) is considered a full-time student. In most cases, full-time registration is required for both the fall and spring semesters. Graduate Assistants must carry the required credit loads and international students must register with visa considerations in mind.

A Ph.D. candidate is required to register continuously for each semester from the time the comprehensive exam is passed and the two-semester residence requirement is met until the dissertation is accepted by the Ph.D. committee, regardless of whether work is being done on the dissertation during this time.

An M.S. student is not required to register for the final semester in order to graduate, make a minor revision to the thesis, or take a final exam, unless required by the student's visa or the Program Chair.

How to Register

You may register for classes in two ways:

- Using the LionPATH web registration system, https://www.lionpath.psu.edu
- Through the Huck Graduate Programs Office

Before the start of the fall semester, the Huck Graduate Programs Office enrolls incoming students in all the required courses, except PLBIO 596, as these courses are under departmental control. For current students, before you register for courses, you should meet with your dissertation, or thesis, advisor and agree on the courses chosen. Detailed instructions on how to register using LionPATH may be found on the web at https://lionpathsupport.psu.edu/student-help/.

Completing Your Enrollment

To enroll in courses for any given semester, you will first need to complete a Pre-registration Activity Guide in LionPATH. This item will appear on your LionPATH To Do List when you are eligible to enroll for the next semester and includes a Financial Responsibility Agreement which you must accept. If you have questions, this tutorial may help: https://tutorials.lionpath.psu.edu/public/S_ActGuide/.

When selecting your classes, you must complete your registration on the enrollment page. Classes in your "shopping cart" are not added to your schedule and are not holding a place for you in the class. Remember that full-time registration requires a minimum of 9.0 credits per semester, or post-comp enrollment in PLBIO 601, which is full-time by definition.

When the Bursar's Office generates semester bills, you will receive a bill in LionPATH. However, as long as you are receiving an assistantship, or fellowship, your tuition will be completely covered, and you will not need to pay this bill. If you have questions about your bill, please contact the Huck Graduate Programs Office or the Bursar's Office (814-865-6528; https://bursar.psu.edu/contact-us).

Failure to complete the enrollment process may result in any or all of the following actions:

- You will not receive any course materials or grades for courses you are attending, and you will be unable to enroll for future semesters.
- Faculty are not obligated to provide instruction or assessments for you.
- If you receive student loans, you may enter into repayment status with your lender.
- If you receive student aid, some of the aid sources may be cancelled and unavailable for reinstatement at a later date.
- If you receive a Federal Work Study award, you will not be eligible for employment.
- If you are living in University Housing, you will need to vacate your housing.
- You will need to complete a Resume Study application to be readmitted into the program and continue working toward your degree.

Late Registration

Registration must be completed prior to the first day of classes each semester. A late registration fee ($250) will be assessed if you register on the first day of classes or thereafter. Students who register late will receive a semester bill from the Bursar's Office for the applicable tuition and fees. Additional fees may apply to courses added or dropped during the late registration period.

See the Academic Calendars at the University Registrar's website for specific deadlines for each semester: https://www.registrar.psu.edu/academic-calendars.

Grading

Most of the courses in the Plant Biology Program are graded with A, A-, B+, B, B-, C+, C, D, and F, which are known as "quality grades". Any grade below a C is not considered to be a passing grade for a required course. A minimum grade point average of 3.0 for work done at the University is required for graduation.

A grade of R is also available for Thesis Research (PLBIO 600), Ph.D. Dissertation Full-Time (PLBIO 601), and Individual Studies (PLBIO 596). R grades do not carry grade points and do not contribute to the grade-point average (GPA), but the credits earned do count toward the credit requirements.

The Graduate Council has established limits on the total number of research credits that can be assigned quality grades. Ph.D. students may accumulate a maximum of 12 quality grade credits for PLBIO 600, and M.S. students have a total limit of 6 quality grade credits.

Seminar Policy

Colloquium

All Plant Biology students must take a Colloquium course (PLBIO 590) during their first two semesters of study. Ph.D. students are required to register for one credit in each semester, and M.S. students are required to register for one credit in either semester. At a minimum, students should attend all the seminars in the weekly Plant Biology seminar series to receive credit. Additional responsibilities are detailed in the course syllabus.

Research Seminars

The Program strongly recommends that all Ph.D. and M.S. students present research seminars in the weekly Plant Biology Seminar series. A seminar may be given after you have formulated a dissertation or thesis research plan and obtained promising preliminary results.

Since many Plant Biology faculty members and students regularly attend the Plant Biology seminars, giving a seminar early in dissertation or thesis research will allow you to receive valuable input and feedback to benefit further research. After you have made substantial progress in dissertation or thesis research and have an opportunity to present the findings at a regional or national meeting, giving a seminar in the Plant Biology Seminar series will help polish your presentation for delivery to wider audiences.

To give a seminar, please sign up with either of the faculty seminar coordinators, Dr. Ying Gu, yug13@psu.edu and Dr. Teh-hui Kao, txk3@psu.edu. The sign-up period precedes the beginning of a semester by several months and spaces are limited.

Thesis and Dissertation Seminars

Ph.D. candidates and M.S. students are expected to present a public dissertation or thesis seminar as part of the final oral exam. The seminar is generally immediately followed by a closed-door oral exam administered by the Ph.D. (doctoral) or M.S. committee.

To give a dissertation or thesis seminar, please provide the Huck Graduate Programs Office with all the necessary seminar information at least two weeks before your seminar so that the formal announcement can be prepared and distributed electronically.

Dates and Deadlines

Throughout your course of study, there will be a series of deadlines that must be met. The Huck Graduate Programs Office will send you periodic notices of upcoming deadlines to assist you, but the final responsibility for being aware of all dates and deadlines rests with you.

The Fox Graduate School publishes several calendars of important dates on its website.

Look up academic dates, and thesis and dissertation deadlines, at https://www.gradschool.psu.edu/academics/academic-dates-and-deadlines/. Academic dates cover thesis and dissertation related deadlines (e.g., format review, last date to apply for graduation on LionPATH), and thesis and dissertation deadlines refer to actual submission (uploading) of a final thesis/dissertation to the eTD website and approval of final thesis/dissertation by committee members..

Other Plant Biology Program deadlines may be found throughout this Handbook, under the appropriate sections.

Information Services

Electronic Messaging

The Plant Biology Program uses several Listserv® mailing lists to distribute information electronically. The Plant Biology Superlistserv serves all Plant Biology Program faculty, all Plant Biology students, and Plant Biology friends (those who have asked to be on our mailing list). There are two additional Listserv® mailing lists that are subsets of the main list, Plant Biology Faculty Listserv for current Program Faculty and Plant Biology Student Listserv for current Plant Biology students. See Appendix I under Section VI for all Plant Biology Listserv® addresses.

The types of messages that are sent to the Plant Biology Superlistserv include upcoming seminar announcements, plant-biology-related news releases from the American Society of Plant Biologists (ASPB) and other organizations, job and research opportunities, and grant announcements.

The Faculty and Student Listserv® mailing lists are used together to send information that is specific to the Plant Biology Program, and separately to send messages to only students or only faculty members.

All new students and new faculty members are automatically added to the Plant Biology Student Listserv and the Plant Biology Faculty Listserv, respectively. Students who have graduated may remain on the Plant Biology Superlistserv for as long as their Penn State Access Account is active.

If you wish to be removed from or remain on the Superlistserv after graduation, please e-mail Carla Rodgers of the Huck Graduate Programs Office at cjr32@psu.edu. All current students and faculty must be on the Plant Biology Student and Plant Biology Faculty Listserv, respectively.

Plant Biology Graduate Student Association

The Plant Biology Graduate Student Association (PB-GSA) was established by Plant Biology graduate students in Summer 2023. The PB-GSA website is at https://sites.psu.edu/pbgsa. PB-GSA coordinates diverse academic and social events for Plant Biology graudate students, and serves as a liaison between the Plant Biology graduate students and Plant Biology faculty, administration, and other graduate student organizations (e.g., Huck Graduate Student Advisory

Committee). All current Plant Biology students are automatically inducted into PB-GSA. The missions of PB-GSA include participation in administrative decision-making processes that affect Plant Biology students; assisting the Program with graduate recruitment events; helping onboard incoming students into campus life; organizing and hosting student-invited Plant Biology seminar speakers; organizing student lunch meetings with external Plant Biology seminar speakers; and fostering social engagement and interactions among members of the Plant Biology community. The executive board of PB-GSA consists of a president, vice president, event planner, treasurer, and seminar coordinator. The Program Chair serves as advisor to PB-GSA. If the Program Chair is unable to serve, the executive board will discuss and ask another Plant Biology faculty member to serve as advisor.

Members of the executive board are elected by the Plant Biology graduate students through online balloting held after the end of each spring semester, in May or June. Elected executive board members serve a one-year term beginning at the start of the subsequent fall semester. The executive board members may run for a second one-year term. The maximum number of terms allowed is two terms total.

Graduate Student Evaluations

Graduate student evaluations create the opportunity for an annual meeting between students and their advisors. The purpose of this meeting is to provide a forum to examine and assess a student's work and progress toward degree.

While students and their advisors should meet regularly over the course of a year, the annual evaluations ensure that at least one meeting has been held to specifically look at the student's progress and performance. This meeting is the opportunity for both student and advisor to talk about long- and short-term goals, share levels of satisfaction, and express feelings and opinions that might otherwise be put off.

Annual Graduate Student Activity Report (GSAR)

The GSAR online system replaces and incorporates the former "Annual Huck Graduate Student Evaluation Review". All students enrolled in the Ph.D. degree programs of the Intercollege Graduate Degree Programs (IGDPs) housed under the Huck Institutes of the Life Sciences will receive an automated invitation to begin to work on their reports. Students will also receive automated prompts as deadlines approach. The report can be accessed at https://grad-activity.science.psu.edu/. This online evaluation must be completed and approved by the Program Chair by mid-August. For M.S. students, their thesis advisors will be provided a link to a separate form for evaluation. You may contact the Huck Graduate Programs Office to ensure that your thesis advisor has received the form.

Leave of Absence

In accordance with the Fox Graduate School policy (http://gradschool.psu.edu/graduate-education-policies/gsad/gsad-900/gsad-906-graduate-student-leave-of-absence/), a student may be granted a leave-of-absence from the Plant Biology Program under certain circumstances. Depending on the source of funding, a student may be permitted to miss summer sessions without being considered as having taken a leave-of-absence. However, after an absence of three consecutive semesters, including the summer semester, the Fox Graduate School requires that the student submit a "Resume Study" application, otherwise the student will be considered withdrawn. This application must be submitted at least one month prior to the semester for which the student wishes to return. The "Resume Study" application can be found here: https://gradschool.psu.edu/admissions/change-or-resume-study.

Any student requiring a leave-of-absence should work closely with their advisor, the Program Chair, and the Huck Graduate Programs Office. Any questions regarding continued funding upon the student's return should be resolved prior to taking a leave-of-absence.

Program Dismissal

When the Program Chair, on the advice of the student's advisor and/or Ph.D. or M.S. committee, determines that a student must be dismissed for unsatisfactory scholarship, the student must be given advance notice in writing. This notice will advise the student of the reasons for the dismissal.

Upon receipt of this notice, the student will have the opportunity to seek a review of the decision. If the student desires such a review, the student must submit a written appeal to the Program Chair within 10 days of receipt of the notice.

The Fox Graduate School policies governing unsatisfactory scholarship can be found at http://gradschool.psu.edu/graduate-education-policies/gcac/gcac-800/gcac-803-procedures-termination-unsatisfactory-scholarship/.

Travel to Meetings

Financial support for travel is considered as a reward for academic excellence and research accomplishments. Its purpose is to further the education of the graduate student. In general, priority is given to those students making a poster and/or oral presentation, and travel support is subject to the availability of funds.

Plant Biology Program Travel Award

The Fox Graduate School provides the Plant Biology Program with $1,200 travel support funds in each fiscal year to support its students to attend scientific conferences and meetings.

Students may receive this travel award only once during their tenure in the Program; however, exceptions may be made on a case-by-case basis. Both M.S. and Ph.D. students are eligible, and the student must make an oral or poster presentation. The amount of an award will vary depending on the number of requests, the needs of the student, and the availability of other sources of support. The maximum award a student may receive is $400.

The travel award money will be budgeted over the Fall and Spring semesters, with any undistributed funds left over from the Fall rolled over into the Spring semester.

To apply for a Plant Biology Program Travel Award, students should extract the Plant Biology Travel Support Request Form from this Handbook (found in Appendix VII under Section VI) and submit the completed form to the Program Chair. There is no deadline for this application, but as funds are very limited, early applications are likely to have an advantage.

Huck Institutes of the Life Sciences Travel Award

The Huck Institutes of the Life Sciences Travel Awards, made possible by the J. Lloyd and Dorothy Foehr Huck Endowment, provide travel support to Ph.D. students enrolled in all Huck graduate programs who will give poster or oral presentations at domestic or international conferences. For detailed information about, and application for, this travel award, please visit https://wiki.vpr.psu.edu/display/HUCKGPA/Graduate+travel+award+requests. The application will first be reviewed by the Huck Graduate Programs Office for eligibility, and if the application is deemed eligible, it will then be sent to the Chair for approval. The maximum award for domestic travel is $750, and the maximum award for international travel is $1,500. Students are only eligible to receive the award twice during their study at Penn State, for attending two domestic meetings, or one domestic and one international.

College of Agricultural Sciences Graduate Student Travel Award

Plant Biology students whose dissertation or thesis advisors are on the faculty of the College of Agricultural Sciences may apply for the Graduate Student Travel Award through the College. The total amount of funding available varies by year, and currently the maximum award per student is $500 for domestic and international travel. Each student is allowed to receive this award once per degree. This award may be combined with other awards and sources of funding. Detailed information about this travel award may be found at http://agsci.psu.edu/students/graduate/funding-opportunities/travel-awards. To apply for an Agricultural Sciences Graduate Student Travel Award, complete the InfoReady form linked within the website. Applications are accepted and reviewed on an ongoing basis.

Other Sources of Funding

At various times, other sources of travel funding are available to Plant Biology students. Such sources include travel grants offered by various professional societies. The Program Chair will send an announcement, usually via e-mail, when such funds become available. Students wishing to travel to meetings should also consult with their advisors to determine if any departmental funds are available.

Huck Graduate Student Advisory Committee

The Huck Graduate Student Advisory Committee (HGSAC) was established in January 2015 and consists of graduate student representatives from each of the six graduate programs in the Huck Institutes of the Life Sciences as well as the Biochemistry, Microbiology and Molecular Biology (BMMB) graduate program of the Department of Biochemistry and Molecular Biology (Eberly College of Science). Currently, there are 17 members on the Committee, with representatives from each graduate program. HGSAC works to represent the graduate students of the Huck Institutes of the Life Sciences by promoting their interests and advocating on important issues. For details about HGSAC, see https://www.huck.psu.edu/resources/students/graduate-students/graduate-student-involvement/huck-graduate-student-advisory-committee.

SECTION II: GENERAL REQUIREMENTS FOR ALL PLANT BIOLOGY PROGRAM DEGREE STUDENTS

Advisors

The Program Chair will serve as the temporary advisor for all entering Plant Biology students prior to their selection of dissertation or thesis advisors. All students in the Ph.D. degree program must conduct laboratory rotations during the first semester of their study. Students should design their laboratory rotation schedule in consultation with faculty members with whom they are interested in the possibility of conducting dissertation research.

Ph.D. students who enroll in the Fall semester are highly recommended to choose their dissertation advisors before the end of the first Spring Semester; Ph.D. students who enroll in the Spring semester may continue to conduct laboratory rotations in summer, and are highly recommended to choose their dissertation advisors before the end of the summer. Students in the M.S. degree program are strongly advised to contact faculty members of interest to select their thesis advisors, prior to or soon after the beginning of their studies. After the selection of their dissertation or thesis advisors, students should inform the Program Chair and Huck Graduate Programs Office so that their student records can be updated. Soon afterwards, students should consult with their advisors to select the title, or tentative title, of their dissertation or thesis research, and provide the Program Chair the information for posting on the Plant Biology Students Webpage, https://www.huck.psu.edu/graduate-programs/plant-biology/people/students. Students should consult with their advisors for approval of their course schedules each semester.

Core Courses

Notes: All Fall 2024 and Spring 2025 courses will be conducted in-person. For PLBIO 590 (Colloquium), some of the seminars may be conducted via Zoom to accommodate external speakers' preferences.

Tutorial Courses

All Plant Biology students must complete two tutorial courses "Plant Resource Acquisition and Utilization" (PLBIO 512) and "Integrative Plant Communication and Growth" (PLBIO 513). Two members of the Program Faculty will each coordinate one of these two courses.

These courses are team taught by the Program Faculty and are designed to cover the breadth of modern plant biology. Students are introduced to faculty research and develop skills in problem solving. One 4-credit tutorial course is taken each semester. Students should complete both courses in the first two semesters of their study. Students who enroll in the Spring 2024 semester will first take PLBIO 513 and then PLBIO 512 in the following Fall semester.

In the tutorial courses, students will be presented with advanced lectures in central areas of plant biology. Each week, a faculty member will present two lectures and assign challenge problems to the students to be solved independently through literature research. Each student will be assigned to provide written solutions to a minimum of four challenge problems in each tutorial course. Students assigned to solve challenge problems on the topic covered in two lectures by a faculty member will discuss their solutions in oral presentations on the Friday of the following week. The quality of each student's performance will be evaluated based on their ability to reason, demonstrated understanding and knowledge of a subject area, as well as creativity.

Those students not writing and presenting a solution to a challenge problem are required to write a summary of the presentations and discussions led by other students.

The dossier of challenge problem papers will constitute the written diagnostic for M.S. students. The challenge problem papers form the basis for the Ph.D. oral qualifying exam.

Colloquium Requirement

Ph.D. students must take the Colloquium course (PLBIO 590) in each of the first two semesters of their study. M.S. students must take this course in either of the first two semesters.

Through attending the weekly Plant Biology Seminar series, the students will be exposed to diverse topics in plant biology presented by invited external speakers, as well as Plant Biology faculty members, postdoctoral researchers, and students. The students will learn from accomplished scientists how to formulate testable hypotheses, design appropriate experimental approaches, critically analyze and interpret experimental data, and effectively communicate research findings to other scientists, etc. These will be critical to the success of their dissertation or thesis research. Moreover, the students will learn some of the research projects being carried out in the labs of the Program faculty.

Ethics, Rigor, Reproducibility and Conduct of Research in the Life Sciences

All Plant Biology degree students are required to take the Ethics, Rigor, Reproducibility and Conduct of Research in the Life Sciences course (MCIBS 591) in the first Fall Semester. This course examines integrity and misconduct in life sciences research, including issues of plagiarism, data collection, publication, authorship, and peer review.

Responsible Conduct of Research Training Requirements and Academic Integrity

All new students in the Plant Biology Program must complete an online Responsible Conduct of Research (RCR) training course during their first year. The online course is offered through the CITI (Collaborative Institutional Training Initiative) Program and supplements the in-class, discussion-based RCR training provided in MCIBS 591 (Ethics, Rigor, Reproducibility and Conduct of Research in the Life Sciences), a required 2-credit course taken during the first year. Together, these two courses satisfy RCR training requirements mandated by Penn State's SARI (Scholarship and Research Integrity) Program, an RCR initiative organized through the Office for Research Protections (an administrative unit within the Office of the Vice President for Research).

First-year students should complete the online CITI RCR course before or during Huck Orientation. To register, go to the Penn State CITI website http://citi.psu.edu where you will find instructions. Select your campus, then select Pennsylvania State University Courses and register for the Biomedical Responsible Conduct of Research Course. Students must work on their own to complete the course modules and pass the on-line quizzes. All modules must be completed before noon, August 20, 2024, and a copy of the student's Completion Report must be submitted to the Huck Graduate Programs Office or via email to Freya Heryla at fqh5144@psu.edu.

For Penn State Faculty Senate Academic Integrity Policy, see http://senate.psu.edu/policies-and-rules-for-undergraduate-students/47-00-48-00-and-49-00-grades/#49-20.

Other Courses Included in the Plant Biology Major

Depending on individual students' background preparation, research interests, and the areas of their dissertation or thesis research, they may take elective courses offered by other academic departments after completing most or all of the required courses. The list below provides some examples of courses that may be considered as courses in the Plant Biology major. Not all the courses are offered every year. Refer to LionPATH for the schedule of each course. Students interested in taking any elective courses should consult with their advisors prior to registering.

See Section V for a detailed list of the courses offered by the Plant Biology Program.

BMB 400	Molecular Biology of the Gene (3)
BMB 443W	Laboratory in Protein Purification and Enzymology (3)
BMB 445W	Laboratory in Molecular Genetics I (2)
BMB 484	Functional Genomics (3)
BIOL 407	Plant Developmental Anatomy (3)
BMMB 551	Genomics (3)
BMMB 852	Applied Bioinformatics (2)
HORT 402W	Plant Nutrition (3)
HORT 407	Plant Breeding (3)
HORT 445	Plant Ecology (3)
HORT/BIOTC 459	Plant Tissue Culture and Biotechnology (3)
PPATH 533	Molecular Genetics of Plant-Pathogen Interactions (3)

Statistics

While not required for a degree in Plant Biology, all students are encouraged to take a course in statistics. Some possible choices are:

STAT 460	Intermediate Applied Statistics (3)
STAT 462	Applied Regression Analysis (3)
STAT 480	Introduction to Statistical Program Packages (1)
STAT 502	Analysis of Variance and Design of Experiments (3)

Grade-Point Average Requirement

A minimum GPA of 3.0 for work done at Penn State is required for the qualifying exam (Ph.D.), written diagnostic exam (M.S.), comprehensive exam (Ph.D.), final oral exam, and graduation. The Fox Graduate School will not schedule exams for students whose GPA is below 3.0.

Transfer of Credits

A maximum of 10 credits of graduate course work earned at accredited institutions within five years of the first registration at Penn State may be applied toward the requirements for an M.S. or a Ph.D. degree. However, credits earned to complete a previous M.S. degree may not be applied toward a second M.S. degree at Penn State.

The Program Chair, the student's dissertation or thesis advisor, and the Director of Graduate Enrollment Services must approve transferred credits. Forms for transfer of credits may be obtained from the Huck Graduate Programs Office or from the Graduate Enrollment Services.

Time Limitation

M.S. students must complete all the degree requirements, including acceptance of the thesis, within eight years of admission to the Plant Biology Program.

Ph.D. students are required to complete the program, including acceptance of the dissertation, within eight years from the date of passing their qualifying exam.

In appropriate circumstances, the Director of Graduate Enrollment Services may grant extensions to the time limitation. The Program Chair, upon recommendation of the student's advisor, must make the request for extension in writing.

English Proficiency

The language of instruction at Penn State is English. All international applicants who have not received baccalaureate or M.S. degrees from institutions in specified exempt countries (https://gradschool.psu.edu/admissions/prepare-to-apply - Minimum-Requirements) must take the TOEFL and submit the test results with the application for admission.

To be considered for admission, the Fox Graduate School and the Plant Biology Program require a minimum TOEFL score of 80 on the Internet-based test (IBT). A minimum of 19 (out of 30) on the speaking portion is required for admission.

The University requires all students whose primary language is not English and who plan to be teaching assistants to take the Penn State American English Oral Communication Proficiency Test (AEOCPT) prior to beginning their first semester. Test results will determine which ESL (English as a Second Language) courses the student is required to take, according to the following table:

AEOCPT SCORE	REQUIRED COURSE	PROGNOSIS
250 - 300	None	Student may teach with no restrictions.
200 - 249	ESL 118G	Must pass the Interactive Performance Test (IPT) before teaching.
150 – 199	ESL 117G followed by ESL 118G	Two semesters of ESL, then IPT before teaching.
<150	ESL 115G, then ESL 117G, then ESL 118G	Three semesters of ESL, then IPT before teaching.

A grade of "A" in each required course must be achieved before the student is permitted to teach.

All international students entering the Program must take the Proficiency test. Even if a student does not plan to be a teaching assistant immediately, it is highly recommended that students earn the certificate of fluency should they be asked to be a teaching assistant at a future time. In addition, those who do not pass the test will find that taking ESL 117G/ESL 118G will greatly benefit their coursework, even if they do not teach. Typically, students who are required to take this test will be scheduled for testing prior to the first semester by the Huck Graduate Program Coordinator, currently Dana Coval-Dinant; if you believe you should be scheduled for this test and do not receive notification of a test date, please contact Dana (dmc6@psu.edu).

Communication and Foreign Language Competence

Effective Fall 1992, the Plant Biology Program discontinued the foreign language requirement for Ph.D. students. This was done to accommodate an increased importance placed on satisfactory competence in English, as described above. Additional courses in English communication and in college teaching preparation may be considered. Examples of appropriate courses include ENGL 417 (The Editorial Process; 3 credits) and ENGL 418 (Advanced Technical Writing and Editing; 3 credits).

Residency

Following admission to the Program and prior to passing the comprehensive exam, over each 12-month period, the Ph.D. student must spend at least two consecutive semesters (FA/SP or SP/FA, not including summer sessions), in residence at University Park as a registered full-time student engaged in academic work in the Program. After a student has met the two-semester residency requirement and has passed the comprehensive exam to become a Ph.D. candidate, no further registration for course credits is required. However, continuous non-credit registration is required as described under "Post-Comprehensive Registration" in Section III.

Thesis and Dissertation Requirements

To graduate with an advanced degree in Plant Biology, each Ph.D. candidate must complete a dissertation and each M.S. student must complete a thesis. The Ph.D. candidate's dissertation advisor or the M.S. student's thesis advisor, committee members, and the Program Chair indicate the acceptance of the dissertation or thesis by their electronic signatures on the final document after it has been uploaded to the Electronic Theses and Dissertations (eTD) site. The dissertation or thesis must also meet the editorial standards of the Fox Graduate School so that it constitutes a suitable archival document for inclusion in the University Libraries. Currently, the Fox Graduate School dissertation and thesis regulations may be found in the publication, *Thesis and Dissertation Guide*, which is available for downloading at: https://gradschool.psu.edu/assets/uploads/documents/Thesis-and-Dissertation-Handbook.pdf.

The Fox Graduate School requires that all dissertations and theses be submitted in electronic format. The dissertation and thesis must be submitted to the Office of Theses and Dissertations at https://etda.libraries.psu.edu by the announced submission deadline for the semester.

SECTION III: THE Ph.D. DEGREE IN PLANT BIOLOGY

The Fox Graduate School Requirements

The Fox Graduate School at Penn State does not specify a required number of courses or credits earned for attaining a Ph.D. degree. The doctoral program consists of a combination of courses, seminars, individual studies, and dissertation research that meet the minimum requirements of the Fox Graduate School and are approved by the Ph.D. committee for each student.

Plant Biology Program Requirements

In addition to the core courses listed in Section II, Ph.D. students must complete both modules of the laboratory-intensive jumpstart courses. These courses are designed to introduce students to the modern techniques and theories used to solve problems in the areas of plant cell biology and plant molecular biology.

The two jumpstart courses earn 2 credits each and meet for five weeks (10 class sessions) each. Both consist of lecture and laboratory components. PLBIO 515 (Modern Techniques and Concepts in Plant Cell Biology) is generally offered in the fall semester, and PLBIO 516 (Modern Techniques and Concepts in Plant Molecular Biology) is generally offered in the Spring semester. Students should have completed both modules by the end of their fourth semester of study and before taking their comprehensive exam.

Transfer of Credits

Students may transfer a maximum of 10 credits of previous graduate course work to Penn State. All transfer credits must have been earned at accredited institutions within five years of the first registration at Penn State. Credits earned to complete a previous M.S. degree may not be applied toward a Ph.D. degree at Penn State.

Forms for transfer of credit may be obtained from the Huck Graduate Programs Office or from Graduate Enrollment Services in 114 Kern Building. The Program Chair and Director of Graduate Enrollment Services must approve any transferred credits.

Minor Field

Ph.D. students in the Plant Biology Program may elect to follow a minor field of study. This requires the approval of the student's Ph.D. committee. A minor consists of no fewer than 15 credits of integrated or articulated work in one field related to, but different from, that of the major. A minor normally may be taken only in one of the approved graduate degree programs offered at Penn State, or in a formal graduate minor program that has been approved by the Graduate Council.

A minor program must have the approval of the departments or committees responsible for both the major program and the minor field. If more than one minor is being proposed, a separate group of courses must be taken for each minor. If a student has already received an M.S. minor in the same field as is being proposed for a doctoral minor, then the 15 credits taken must be above and beyond those used for the M.S. minor. At least one faculty member from the minor field must be on the student's Ph.D. committee.

English Competency

A Ph.D. student is required to demonstrate a high level of competence in the use of the English language, including reading, writing and speaking, as part of the language and communications requirements for the Ph.D. degree. All Ph.D. students (domestic and international) in the Plant Biology Program will be evaluated on their English writing competency by way of the paper selected from those written for the tutorial courses, PLBIO 512 and PLBIO 513, for the oral qualifying exam.

If a student fails to demonstrate acceptable writing skills, the student will be required to work with an English tutor or enroll in additional English composition courses. When appropriate, the student will then be reevaluated.

The oral qualifying exam will also be used to assess English reading and speaking competency. Student performance will be evaluated on clarity of understanding and ability to clearly organize and present a set of ideas. Students not demonstrating acceptable competence will be required to present verbal critiques of assigned papers to their dissertation advisors at least monthly until the advisors are satisfied with their level of competence in the use of the English language.

International students should note that passing the TOEFL minimum requirement does not demonstrate the level of competence expected of a Ph.D. student at Penn State. Soon after arrival at Penn State, international students from non-English speaking countries will be tested for their oral proficiency in English by the Department of Applied Linguistics. Based on the results of this examination, a student may be required to complete one or more of the special English as a Second Language courses (ESL 115G, 117G, and 118G). Please see the "English Proficiency" heading under Section II for details.

Qualifying Examination

A student who has been admitted to the Fox Graduate School and has been accepted by the department or committee in charge of a major program in which a doctorate is offered may begin working toward a Ph.D. degree. However, the student has no official status as a Ph.D. student until they have passed the qualifying exam.

One of the main goals of the qualifying exam is to determine the potential of a student to successfully obtain a Ph.D. degree. The qualifying exam is intended to be a rigorous test of a student's abilities, prior to the major investment in time and effort necessary to pass the comprehensive exam.

In April 2001, the Program Chair, based on student input and in consultation with the Program Faculty, devised a new format for the Plant Biology Program qualifying exam. The new exam procedure became effective for the class of students that entered the Program in August 2000 and took their qualifying exams by the end of the Fall 2001 semester.

The Plant Biology Program qualifying exam is an oral exam based on the challenge problem papers a student wrote for the tutorial courses, PLBIO 512 and PLBIO 513.

The oral qualifying exam may be given after at least 18 credits have been earned in graduate courses eligible to be counted towards the degree (including graduate credits earned previously at other recognized institutions). The student must have a minimum of 3.00 GPA and must not have incomplete or deferred grades. The exam must be taken within three semesters (summer excluded) of entry into the Plant Biology Program.

Enrollment for Qualifying Examination

To assist students and ease funding complications, the Graduate Council decided in March 2001 that enrollment would no longer be required during the summer session for students to take their doctoral qualifying exam. However, enrollment is still required to take the qualifying exam during the fall and spring semesters.

Assignment of Challenge Problem Paper for Oral Qualifying Examination

Immediately after the end of the second semester of study (the first Spring Semester for the students that enroll in the Fall 2024 semester, and the first Fall Semester for the students that enroll in the Spring 2025 semester), students will be asked by the Chair of the Qualifying Examination Committee to select four of the challenge problem papers they have written in PLBIO 512 and PLBIO 513, and rank order the papers. The Chair of the Qualifying Examination Committee, in consultation with the coordinators of these two tutorial courses, will choose one paper (No. 1 ranked, if at all possible) from those each student has submitted for the student to defend on the qualifying exam.

Within one month after the end of the second semester of study, students will be told which challenge problem paper each will prepare for the oral qualifying exam. Students will have the option of rewriting the assigned paper if they so choose. If they choose to rewrite, they must inform the Chair of the Qualifying Examination Committee immediately after the paper has been assigned, and the Chair will set the length of time allowed for them to complete the rewriting.

Qualifying Examination Committee

Annually before the end of the spring semester, the Program Chair appoints the Chair of the Qualifying Examination Committee. After all first-year students have each been assigned one paper to defend on their qualifying exams, the Program Chair will appoint the members of the Qualifying Examination Committee, which forms the pool from which qualifying exam panels are assembled, to administer the qualifying exam to the students.

The number of committee members will vary depending on the number of students taking the qualifying exam and the exact papers that the students have been assigned to defend for the qualifying exam. The Program Chair will appoint to the Qualifying Examination Committee all faculty members whose challenge problems have been assigned to students to defend, and additional faculty members to serve as the chair of one or more of the qualifying exam panels.

Each student's qualifying exam panel consists of three Plant Biology faculty members: a chair, the faculty member whose challenge program is assigned to the student to defend, and the student's dissertation advisor. If a student has a co-advisor, only the advisor serves on the student's qualifying exam panel. Students may take the qualifying exam during the summer session, and must pass the exam by the end of the third semester in the Program (i.e., the second Fall Semester for those who enroll in the Fall 2024 semester, and the second Spring semester for those who enroll in the Spring 2025 semester).

Scheduling and Taking Qualifying Examination

To schedule your qualifying exam, you must first contact your qualifying exam panel members and arrange a mutually agreeable time for the exam. All the qualifying exam panel members must be present for the exam to take place. The exam may be conducted in-person, fully-remote, or hybrid (with in-person and remote participants). If the exam will be conducted in-person, you must arrange for and reserve a room in which to hold the exam by contacting your advisor's home department or the Huck Graduate Programs Office. If the exam will be conducted in hybrid mode or fully-remote, the chair of your qualifying exam panel will set up a remote meeting room and inform you and the other two panel members of the URL link prior to the

exam. If you will participate remotely, you need to use an iPAD or a similar device for your "chalk and blackboard" presentation. If necessary, you may borrow the Program's iPAD and Pencil from the Program Chair.

After you have scheduled your exam, inform Freya Heryla, fqh5144@psu.edu, of the Huck Graduate Programs Office of the time/date of the exam, and location if it is to be conducted in person or in hybrid mode, so that your exam paperwork can be prepared. Please allow at least three workdays for the qualifying examination report form to be prepared and provided to the panel members.

Your qualifying exam consists of your giving an oral presentation of the assigned challenge problem paper. The presentation should be in "chalk and blackboard" format, and you are not allowed to use a PowerPoint presentation. You may use a single PowerPoint slide with titles of the areas to be discussed, but you are not allowed to bring the paper you wrote and may only bring a one-page outline of the solution you are going to present. Your qualifying exam panel will ask questions on your presentation and challenge problem paper to examine your ability to synthesize knowledge from facts and to think on your feet, and to determine your aptitude for research. All three panel members will vote on your performance. This exam will also be used as one additional mechanism to assess English competency. Please see the "English Competency" heading of this Section for additional information.

Evaluation of Examination Performance

After deliberation of the student's performance and before leaving the exam, each panel member should indicate on the report form their rating of the student's general scholarly achievement and prediction of the student's ability to successfully pursue a Ph.D. degree, and sign the form. It is highly recommended that the chair summarize comments and recommendations of the panel for the student's plan of study. The panel then informs the student of the outcome of the exam (see below). Immediately following the exam, the chair should send the completed report form to Freya Heryla of the Huck Graduate Programs Office. The form may be sent electronically. The Program Chair and the Office will then inform the Fox Graduate School of the results of the exam.

The possible results are:

PASS – A favorable vote of two-thirds of the qualifying exam panel members is required for a student to pass the qualifying exam.

FAIL – The student has the option to retake the qualifying exam one time, at a date no later than 90 days following the first exam and before the end of the third semester in the Program.

FAIL WITHOUT RE-EXAMINATION OPTION – This decision results in the termination of the student from the Plant Biology Ph.D. degree program.

After the qualifying exam results have been received and processed by the Fox Graduate School, and if you pass, you will receive a letter from the Fox Graduate School informing you of your official status as a Ph.D. student at Penn State.

Selection and Appointment of Dissertation Advisor

All Ph.D. students are required to enroll in at least one semester of PLBIO 596 (Individual Studies) and conduct laboratory rotations in one or both semesters of their first year of study. It is highly recommended that each student explore possible dissertation research opportunities with at least two faculty members. Students should inform the Program Chair the names of the faculty members with whom they will conduct laboratory rotations. The Program Chair will serve as the temporary advisor of each student prior to selection of the dissertation advisor.

The student should choose their dissertation advisor no later than the beginning of the second Fall Semester for those that enroll in Fall 2024, or the second Spring semester for those that enroll in Spring 2025. You will then become associated with your advisor's laboratory and academic department (but you will remain a student of the Plant Biology Program). The advisor's department provides research facilities and office space, and may provide financial support in the form of a research assistantship and/or a teaching assistantship.

Your dissertation advisor must be a member of the Plant Biology Program Faculty, but you may choose a co-advisor from outside the Program. Among other duties, your advisor should approve your schedule each semester. Please contact the Huck Graduate Programs Office as soon as you have chosen your dissertation advisor so that your student record can be updated.

Appointment of Ph.D. Committee

Committee Structure

The Ph.D. committee must have at least four active members of the Graduate Faculty, including a Chair, Dissertation Advisor (if not the Chair), Major Program Member(s), Outside Field Member(s), and Outside Unit Member(s). At least two members must be members of the Plant Biology Program Faculty. The student's dissertation advisor must be a committee member but does not have to be the Chair of the committee. The committee chair must be a member of the Plant Biology Program Faculty. An Outside Field Member has a disciplinary expertise different from the student's major field of study, and is responsible for broadening the disciplinary perspective available to the student and the Ph.D. committee. The Outside Field Member may be a faculty member of the Plant Biology Program, but may not also serve as a major program member. An Outside Unit Member must have their primary academic appointment in an administrative unit different from that of the student's Ph.D. committee chair and dissertation advisor. The Outside Unit Member is responsible for bringing to the attention of the student and the Ph.D. committee non-academic issues (including, for example, conflicts of interest) that may impact the student's progress. In some cases, the same faculty member may serve as both Outside Field Member and Outside Unit Member, if this individual has a primary appointment outside the administrative home of the student's Ph.D. committee chair and dissertation advisor, and also has disciplinary expertise outside the student's major field of study.

If the student has chosen to study a minor field, at least one Minor Program Member for each graduate minor must be on the Ph.D. committee. The Minor Program Member must be a member of the Graduate Faculty and a member of that minor graduate program.

In some cases, the student may wish to have a Special Member on the Ph.D. committee. A Special Member is a person who is not a member of the Penn State Graduate Faculty but has particular expertise in the student's research area. The Special Member does not have to be affiliated with the University. A curriculum vitae and a memo supporting the student's request must accompany the committee appointment paperwork. The Special Member is appointed upon recommendation by the Program Chair and approval of the Dean of the Fox Graduate School (via the Office of Graduate Enrollment Services). The Special Member must attend both comprehensive and final oral exams, and must sign both exam documents and the final dissertation.

In some cases, you may wish to have a Signatory Member on your committee. The Signatory Member participates in guiding your research outline, approves your dissertation proposal, and reads and signs your final dissertation. However, this person is not appointed as an official member of the committee and does not have to participate in administering the comprehensive and final oral exams. To appoint a Signatory member, you must have the approval of your

Committee Chair and the Program Chair. You must supply the person's curriculum vitae when you request your appointment paperwork from the Huck Graduate Programs Office.

Committee Responsibilities

Your Ph.D. committee is responsible for your general guidance as a student. The committee will approve the broad outline of your academic program and your dissertation proposal. This may be done in the Program Planning Meeting, which is held after you have passed the qualifying exam and formulated a research plan with your dissertation advisor. It is recommended that this meeting be held within two semesters of passing the qualifying exam.

The committee will also prepare, administer, and evaluate your benchmark examinations, comprehensive exam and final oral exam. A favorable vote of at least two-thirds of the members of the committee is required to pass these exams. If you fail an exam, it is the responsibility of the committee to determine whether or not another exam may be taken.

Procedure for Ph.D. Committee Appointment

Appointing a Ph.D. committee is a formal process, done through the Fox Graduate School. A student's Ph.D. committee must be appointed, and the signed Doctoral Committee Signature Form must be submitted to the Fox Graduate School, no later than one calendar year following the date of the student's successful completion of the qualifying exam.

To assemble a committee, the student should consult with their advisor to select appropriate faculty members, and contact them to determine if they are willing and able to serve. After getting agreements, the student should inform the Huck Graduate Programs Office of the make-up of their Ph.D. committee, indicating in what capacity each will serve, so that the committee appointment form can be prepared. This may be done in person, by telephone, or by e-mail.

Huck Graduate Programs Office staff will initiate the Doctoral Committee Signature Form in Adobe Sign. The student, followed by all committee members in turn, and lastly the Program Chair will be sent a link to sign the form in Adobe Sign. When all signatures have been added, the form will be routed to the Fox Graduate School and a copy will be provided to the Huck Graduate Programs Office. Formal appointments cannot be made until the form is fully signed.

The Fox Graduate School will process the formal appointment of the committee members. This may take up to three weeks after the Fox Graduate School has received all the necessary documents. To avoid problems, you should have your committee appointed and in place well before attempting to schedule your comprehensive exam.

Changes in Committee Membership

For various reasons, it may occasionally become necessary for you to make changes to your committee membership. To make any changes to an appointed committee, contact the Huck Graduate Programs Office.

To add a member, you must inform the Huck Graduate Programs Office of the name and committee role of the person being added. A new Doctoral Committee Signature Form will be prepared. The student, any new committee member(s), and the Program Chair will need to sign the form. The signed form will be routed to the Fox Graduate School and a copy will be provided to the Huck Graduate Programs Office. This may take up to three weeks after the Fox Graduate School has received all the documents before changes in committee membership become finalized.

Ph.D. Committee Annual Meeting

After the student's Ph.D. committee is appointed, the student needs to schedule an annual committee meeting every year. (One of the meetings may be the program planning meeting described in the next section.) The annual meeting allows the Ph.D. committee members to monitor, and provide input on, the student's research progress. It is the student's responsibility to schedule the annual meeting at a time when all committee members are available to attend. This meeting may be conducted in-person, fully-remote, or hybrid (with in-person and remote participants). If the meeting will be conducted in-person or in hybrid mode, the student must arrange for and reserve a room in which to hold the meeting by contacting their advisor's home department or the Huck Graduate Programs Office. If the meeting will be conducted in hybrid mode or fully-remote, the student's advisor will set up a remote meeting room and inform everyone else of the URL link prior to the meeting.

Prior to the meeting, the student should extract the Plant Biology Ph.D. Committee Annual Meeting Form from this Handbook (See found in Appendix VI under Section VI) and complete the form. It is highly recommended that the student prepare a summary of their dissertation research/research plan and provide it to all committee members at least one week prior to the meeting. The summary should not be more than 5 pages, and may include objectives, hypotheses to be tested, experimental plan, and any results obtained. The student may use PowerPoint slides to present their research. At the end of the meeting, the committee will determine whether the student's research progress is satisfactory or unsatisfactory. All committee members and the student must sign the form. The dissertation advisor will summarize the committee's comments/suggestions, and provide the summary along with the signed form to the student, other committee members, and Freya Heryla of the Huck Graduate Programs Office. When completing the annual Graduate Student Activity Report, the student will be required to attach this form as evidence that a Ph.D. committee annual meeting was held in the reporting year.

Program Planning Meeting

The purpose of this meeting is for you to discuss proposed dissertation research with your Ph.D. committee before taking the comprehensive exam. The Program Planning Meeting is optional, but it will help you better prepare for the comprehensive exam. If you plan to hold a program planning meeting, it is recommended that you schedule this meeting within two semesters after passing your qualifying exam. All your Ph.D. committee members should attend this meeting and your dissertation advisor will be in charge. The meeting may be conducted in-person, fully-remote, or hybrid (with in-person and remote participants). If the meeting will be conducted in-person or in hybrid mode, you must arrange for and reserve a room in which to hold the meeting by contacting your advisor's home department or the Huck Graduate Programs Office. If the meeting will be conducted in hybrid mode or fully-remote, either you or your advisor will set up a remote meeting room and inform everyone else of the URL link prior to the meeting.

You should prepare your dissertation proposal, in consultation with your advisor, and distribute it to the committee at least two weeks before the meeting. The proposal should not exceed 20 pages (excluding the title page, table of contents, and references), and should include a brief literature review, hypotheses to be tested, objectives and experimental plan, and any preliminary results obtained. Prior to the meeting, you should extract the Dissertation Proposal Approval Form from this Handbook (found in Appendix IV under Section VI) and complete the form. At the beginning of the meeting, you will give an oral presentation of your proposed dissertation research. The committee will determine your strengths and weaknesses in the subject matter areas through questioning and informal discussion. The discussion will center on the dissertation

proposal, e.g., feasibility of the proposed research and quality of the preliminary results obtained. The committee will review and make any necessary modifications to the proposal. The proposal may be approved, approved pending revision, or not approved. All committee members must sign the Dissertation Proposal Approval Form, indicating the collective decision of the committee. You should also sign the form and email the completed form (in a PDF file) to Freya Heryla of the Huck Graduate Programs Office.

If major changes to the proposal are required, or if the proposal is not approved, you should discuss the necessary changes with the individual committee members and revise your proposal in accordance with their comments/suggestions. You should then provide the committee members the revised proposal for review and approval. This should be completed within one month of the original meeting. If necessary, contact the Huck Graduate Programs Office for another copy of the typed Dissertation Proposal Approval Form.

Comprehensive Examination

Each Ph.D. student is required to pass a comprehensive exam to become a Ph.D. candidate. The exam should be scheduled within a year of completion of all required course work to provide students with timely assessment of their ability to complete their dissertation, and it must be scheduled no later than five years following the passing of the qualifying exam. At the time the comprehensive exam is administered, the student must be in good academic standing, must have a minimum GPA of 3.0 for work completed at the University as a graduate student, and may not have deferred or missed grades. The student must also have demonstrated a high-level of competence in the use of the English language, including reading, writing, listening and speaking. (See English Competency of this Section.)

The purpose of the comprehensive exam is to assess the student's mastery of the major, and if appropriate, minor, field of study, and whether the student is prepared to succeed in their dissertation research.

Enrollment for Comprehensive Examination

The comprehensive exam must take place at the University Park campus, and the student must be physically present and enrolled during the semester that the exam is scheduled, even during the summer sessions. Students who have held a graduate assistantship or fellowship during the prior fall and spring semesters and who plan to take the comprehensive exam during the summer, may apply to the Fox Graduate School Summer Tuition Assistance Program (STAP). The deadline for this application can vary by year but is usually around March 31. Please consult the STAP website, https://secure.gradsch.psu.edu/stap/index.cfm, or the Huck Graduate Programs Office for specific details and deadlines.

To satisfy the Fox Graduate School's examination enrollment requirement, you only need to be enrolled for one credit. However, you should consider any funding or visa stipulations regarding enrollment that may take precedence. During the summer, you may enroll for one credit of PLBIO 600 (Thesis Research). This enrollment will be good for the entire summer, until classes start in the fall, allowing the comprehensive exam to be scheduled more easily.

You should not register for PLBIO 601 (Full-time Ph.D. Dissertation) or PLBIO 611 (Part-time Ph.D. Dissertation) until the semester following your comprehensive exam.

Scheduling Comprehensive Examination

Scheduling a comprehensive exam is a formal process, done through the Fox Graduate School. The exam is officially scheduled and announced by the Director of Graduate Enrollment

Services upon recommendation of the Program Chair. You must schedule your exam at least three weeks in advance.

To schedule a comprehensive exam, you must first contact all your Ph.D. committee members to determine a mutually agreeable date and time for the exam. All the committee members must be available to participate for the exam to take place. Effective May 8, 2023, the Plant Biology Program has adopted "All Modes Allowed" for conducting the comprehensive exam. This exam may be conducted fully in-person, fully-remote, or hybrid (with some individuals participating in-person and with others participating remotely). Student's preference for the delivery mode will be strongly considered, but the student and advisor must agree on the mode. If the student and advisor cannot agree on the mode, the Program Chair will make the final decision. Either the student or advisor can appeal the decision of the Program Chair to the Associate Dean of the Fox Graduate School for Graduate Affairs. If the exam will be conducted fully in-person or in hybrid mode, you must arrange for and reserve a room in which to hold the exam by contacting your advisor's home department or the Huck Graduate Programs Office. If the exam will be conducted in hybrid mode or fully-remote, your advisor will set up a remote meeting room and inform everyone else of the URL link prior to the exam.

When you have all this information, contact the Huck Graduate Programs Office by phone, e-mail, or in person at least three weeks prior to the requested exam date. The Huck Graduate Programs Office will prepare your examination request form, obtain approval from the Program Chair, and then submit the approved request form to the Fox Graduate School for final approval.

Format of Comprehensive Examination

The comprehensive exam is an oral exam administered by the student's Ph.D. committee with the Chair of the committee in charge. If you held a program planning meeting, you should use that approved proposal as the basis to prepare your comprehensive exam proposal. The proposal should not exceed 20 pages (excluding the title page, table of contents, and references), and you should distribute it to the committee at least two weeks before the exam. The format of the comprehensive exam is similar to that of the program planning meeting. You will first give an oral presentation of your proposed dissertation research. The committee members will then take turns asking you questions to determine whether you have attained a level of training in plant biology of sufficient depth and breadth to be worthy of pursuing the Ph.D. degree. At the end of the exam, each committee member will be asked to rate your performance.

Evaluation of Examination Performance

The possible results are:

PASS – A favorable vote of two-thirds of the committee members is required for a student to pass the comprehensive exam.

FAIL – The student has the option to retake the comprehensive exam one time at a date no later than 90 days following the first exam.

FAIL WITHOUT RE-EXAMINATION OPTION – This decision results in the termination of the student from the Plant Biology Ph.D. degree program.

Effective June 23, 2022, comprehensive exam and final oral exam results should be submitted to the Fox Graduate School via LionPATH. It is highly recommended that all committee members submit their ratings and comments (if any) before leaving the exam. However, the chair of the committee cannot access the exam form until all the other members, including any co-chairs, have submitted their individual ratings. This way, the chair only has to access the link once to enter individual ratings, and the chair is also responsible for approving the overall rating. In the case of a committee with multiple chairs/co-chairs, the chair listed first on the committee

appointment form will provide the final result. The exam results must be reported to the Fox Graduate School within five business days after the exam.

The results of the comprehensive exam will be entered into your official record once the Fox Graduate School has received them.

Post-Comprehensive Registration

Once you have passed the comprehensive exam, you must maintain your status as a Ph.D. candidate by remaining continuously registered until you pass your dissertation defense. This does not include the summer sessions unless your final oral exam takes place during a summer session. Course numbers 601 and 611 are used for special non-credit registration for dissertation preparation work.

You may enroll in PLBIO 601 (Ph.D. Dissertation Full-Time) and up to a maximum of three additional credits of course work for audit by paying only the dissertation fee (which is usually covered by your research assistantship). Students wishing to take up to a maximum of three additional credits of coursework for credit, along with PLBIO 601, may do so by paying the dissertation fee and an additional flat fee (the latter of which may not be covered by your research assistantship). Enrollment for more than three credits, either for audit or credit, will require that the student enroll in PLBIO 600 for research credits and will result in a full tuition charge at the pre-comprehensive rate. If you plan to take any courses after passing the comprehensive exam, particularly taking courses for credit, you should discuss this with your dissertation advisor and seek their approval.

If you have passed your comprehensive exam and wish to enroll part-time, you should choose PLBIO 611 (Ph.D. Dissertation Part-Time).

Teaching Experience

The Plant Biology Program does not have a teaching requirement; however, it strongly encourages Ph.D. students to acquire teaching experience, especially if their future career will include a teaching component. Some program faculty and their academic departments have teaching assistantships available. If you are interested in teaching, be sure to ask your dissertation advisor about any available opportunities. Some departments (e.g., Biochemistry and Molecular Biology) require that students take a pedagogy course before they are eligible for serving as teaching assistants, and some departments (e.g., Biology) allow students to take a pedagogy course during the semester in which they wish to serve as teaching assistants for the first time. The pedagogy course offered by the Biochemistry and Molecular Biology Department is BMMB 801 (Foundations of Teaching in Biochemistry, Microbiology, and Molecular Biology;1 credit) and the pedagogy course offered by the Biology Department is BIOL 893 (Experiential Teaching in Biology; 2 credits); both courses are only offered in the fall semester.

In the semester that students serve as TA, they will register for SUBJ 602 (Supervised Experience in College Teaching). For example, if they serve as TA in the Biology Department, they will register for BIOL 602, and if they serve as TA in the Biochemistry and Molecular Biology Department, they will register for BMMB 602. Please see the Graduate Bulletin for more details about SUBJ 602. The link to the Bulletin is: https://bulletins.psu.edu/graduate/.

The link is also listed in Appendix I under Section VI. Students wanting recognition of their commitment to college teaching may earn the Fox Graduate School Teaching Certificate; for details, see https://gradschool.psu.edu/student-support/professional-development/penn-state-cirtl-teaching-certificate.

Final Stages

The final stages of completing a Ph.D. degree require careful planning, with special attention paid to the details, many of which are time sensitive.

When a specific semester for graduation is targeted, it may be helpful to set up a timeline and work backward from the announced date of the commencement ceremony to be sure that everything can be completed to meet all the deadlines.

Application for Graduation

To graduate, you must first have your name placed on the graduation list for the appropriate semester. Notifying the Fox Graduate School is achieved through the "Apply for Graduation" process which can be done through LionPATH at https://lionpath.psu.edu. There is a deadline to file your "Apply for Graduation", and it falls early in each semester. The deadline varies by semester and can be found on the Thesis, Dissertation, Performance and Oral Presentation Deadlines Calendar website (see Appendix I under Section VI), or by contacting the Huck Graduate Programs Office. When you believe that you may be ready to graduate, it is best to file your application with the Fox Graduate School. It is much easier to remove your name from the graduation list than to get it added on after the deadline!

Final Oral Examination, Dissertation Deadlines, and Graduation

Each semester, the Fox Graduate School determines a deadline by which a final oral exam must have been passed in order to graduate in that same semester. The exact date varies by semester and can be found on the Thesis, Dissertation, Performance and Oral Presentation Deadlines Calendar website (see Appendix I under Section VI). In addition, there are a series of deadlines issued by the Office of Theses and Dissertations before which you must submit various drafts of your dissertation. These deadlines can also be found on the website mentioned above.

Enrollment for Final Oral Examination

The student must be enrolled during the semester that the final oral exam is scheduled, even during the summer sessions. Students who have held a graduate assistantship or fellowship during the prior fall and spring semesters and who plan to take the final oral exam during the summer, may apply to the Fox Graduate School Summer Tuition Assistance Program (STAP). The deadline for this application can vary by year but is usually around March 31. Please consult the STAP website (https://secure.gradsch.psu.edu/stap/index.cfm) or the Huck Graduate Programs Office for specific details and deadlines.

To satisfy the Fox Graduate School's enrollment requirement, you only need to be enrolled for one credit. However, you should consider any funding or visa stipulations regarding enrollment that may take precedence. During the summer, you may enroll for PLBIO 601 or one credit of PLBIO 600. This enrollment will be good for the entire summer, until classes start in the fall, allowing the final exam to be scheduled more easily.

Scheduling Final Oral Examination

When scheduling your final oral exam, please note the Fox Graduate School requires that a minimum of three months elapse between the comprehensive exam and the final oral exam.

The final oral exam is scheduled with the recommendation of your dissertation advisor, after you have satisfied all the other requirements for the Ph.D. degree. When choosing a date, remember that there is a published deadline, set by the Fox Graduate School, as the last day a final oral exam may be taken for graduation in the same semester.

Scheduling a final oral exam is a formal process, done through the Fox Graduate School. The exam is officially scheduled and announced by the Director of Graduate Enrollment Services upon recommendation of the Program Chair. To schedule your final oral exam, you must first contact all your Ph.D. committee members to determine a mutually agreeable date and time for the exam. This exam consists of a public dissertation seminar, which is usually immediately followed by a closed-door oral exam by your Ph.D. committee. All the committee members must be available to participate for the exam to take place.

Effective May 8, 2023, the Plant Biology Program has adopted "All Modes Allowed" for conducting the final oral exam. This exam may be conducted fully in-person, fully-remote, or hybrid (with some individuals participating in-person and with others participating remotely). Student's preference for the delivery mode will be strongly considered, but the student and advisor must agree on the mode. If the student and advisor cannot agree on the mode, the Program Chair will make the final decision. Either the student or advisor can appeal the decision of the Program Chair to Associate Dean of the Fox Graduate School for Graduate Affairs. If the exam will be conducted fully in-person or in hybrid mode, you must arrange for and reserve a room in which to hold the exam by contacting your advisor's home department or the Huck Graduate Programs Office. If the exam will be conducted in hybrid mode or fully-remote, your advisor will set up a remote meeting room and inform everyone else of the URL link prior to the exam.

When you have all the information about your final oral exam, contact the Huck Graduate Programs Office by phone, e-mail, or in person at least three weeks prior to the requested exam date. The Huck Graduate Programs Office will prepare your examination request form, obtain approval from the Program Chair, and then submit the approved request form to the Fox Graduate School for final approval.

Distribution of Dissertation Final Draft

The final draft of your dissertation should be distributed to all your Ph.D. committee members at least two weeks prior to the scheduled exam. The timely distribution of the dissertation is very important, as your committee members must be allowed time to critically read and examine your dissertation before the final oral exam. Failure to allow your Ph.D. committee members two weeks to read the dissertation final draft could result in a delay of the final oral exam.

The dissertation provided to the Ph.D. committee should be in final draft form with respect to style and content. It should have all appropriate notes, illustrations, bibliography, tables, etc.

Public Dissertation Seminar

As stated earlier under the Seminar Policy in Section I, students are required to present a public dissertation seminar, which is usually then followed by a closed-door oral exam with the Ph.D. committee. Students should schedule the seminars through the Huck Graduate Programs Office so that seminar announcements can be prepared and distributed electronically.

Closed-Door Final Oral Examination

The major part of the final exam will be a closed-door oral dissertation defense. The following points may be used as guidelines for evaluation:

- Has the candidate demonstrated originality, creativity, and resourcefulness in conduct of the research?
- Does the research utilize proper experimental designs, appropriate techniques, and are these adequately described?

- Is the candidate able to satisfactorily defend the methods, findings, and conclusions of the research as embodied in the dissertation?
- Is the candidate sufficiently knowledgeable in the literature of the dissertation subject, and can the candidate place the contribution of this subject in proper context with the literature?
- Has the dissertation research been published, or is it worthy of publication, in refereed scientific journals?

Evaluation of Final Oral Examination Performance

The possible results are:

PASS – A favorable vote of two-thirds of the committee members is required for a student to pass the final oral exam.

FAIL – The student has the option to retake the final oral exam one time at a date no later than 90 days following the first exam.

FAIL WITHOUT RE-EXAMINATION OPTION – This decision results in the termination of the student from the Plant Biology Ph.D. degree program.

Effective June 23, 2022, final oral exam results should be submitted to the Fox Graduate School via LionPATH. It is highly recommended that all committee members submit their ratings and comments (if any) before leaving the exam. However, the chair of the committee cannot access the exam form until all the other members, including any co-chairs, have submitted their individual ratings. This way, the chair only has to access the link once to enter individual ratings, and the chair is also responsible for approving the overall rating. In the case of a committee with multiple chairs/co-chairs, the chair listed first on the committee appointment form will provide the final result. The exam results must be reported to the Fox Graduate School within five business days after the exam.

The results of the final oral exam will be entered into your official record once the Fox Graduate School has received them.

Final Submission of Ph.D. Dissertation

Effective January 15, 2021 the deadline for final committee members' review/approval of theses/dissertations within the eTD site will be earlier in the semester to accommodate a change in the review process by the Office of Theses and Dissertations. The dissertation should be reviewed by each committee member and changes finalized before the semester deadlines to allow for enough time for the Office of Theses and Dissertations to review and approve. Final review and approval of the dissertation by the committee should be completed before uploading the final submission to the eTD site. No changes should be requested following the final submission to the eTD site. Deadlines for students to upload the final dissertation and committee members to electronically sign the final uploaded document are published in the Thesis, Dissertation, Performance and Oral Presentation Deadlines Calendar, which can be accessed by using the link listed in Appendix I under Section VI.

For information on preparation and submission of dissertations electronically, visit: https://etda.libraries.psu.edu. The dissertation (in a single PDF file) must be uploaded to the eTD website by the announced submission deadline for the semester. In some cases, the dissertation advisor may request a bound copy of the dissertation. In this case, all costs for dissertation typing, illustrations, reproduction, and binding (if applicable) are borne by the student.

Recommended Schedule for the Ph.D. Degree

This brief outline describes a typical course of study. Specific details will vary depending on an individual student's advisor and Ph.D. committee recommendations. Please use the Ph.D. Checklist in Appendix II under Section VI to keep track of your individual progress.

Prior to passing the comprehensive exam, students should be registered for a minimum of 9 credits of courses each semester to remain a full-time student, but it is highly recommended that students not take more than 12 credits of courses in a semester.

From Year 2 onwards, students are strongly encouraged to continue to attend the weekly Plant Biology Seminar series. During summer sessions, students are expected to conduct dissertation research and participate in regional, national, or international scientific meetings as appropriate.

Prior to First Semester

• Discuss course of study with Program Chair during Orientation.

• Complete the CITI online RCR course and submit the Course Completion Report to Huck Graduate Programs Office, or via e-mail to Freya Heryla at fqh5144@psu.edu, by noon, August 20, 2024 (See Page 15, Section II).

The following recommended schedule is for students who enroll in Fall 2024.

First Semester

• Take formal coursework:

PLBIO 512: Plant Resource Acquisition and Utilization (4 credits)

PLBIO 515: Plant Cell Biology (2 credits)

PLBIO 590: Colloquium (1 credit)

PLBIO 596: Individual Studies (1 credit)

MCIBS 591: Ethics, Rigor, Reproducibility and Conduct of Research in the Life Sciences (2 credits)

Appropriate English courses if required (international students)

• Identify potential areas for dissertation research

• Select and appoint dissertation advisor, if identified

Second Semester

• Take formal coursework:

PLBIO 513: Integrative Plant Communication and Growth (4 credits)

PLBIO 516: Plant Molecular Biology (2 credits)

PLBIO 590: Colloquium (1 credit)

PLBIO 596: Individual Studies (2 credits), if continuing with laboratory rotations,

or

PLBIO 600: Thesis Research (2 credits), if dissertation advisor chosen in First Semester

Appropriate English courses if required (international students)

• Select and appoint dissertation advisor by the end of Summer (if not identified in First Semester)

Third Semester

• Continue to take formal coursework, if necessary
• PLBIO 600: Thesis Research (1 – 9 credits)
• Complete qualifying exam, if not completed in previous Summer
• Establish a Ph.D. committee (highly recommended)
• Hold Program Planning Meeting (optional, but highly recommended):
  Write a detailed proposal of research to be undertaken
  Submit proposal to Ph.D. committee for approval
• Prepare for comprehensive exam

Fourth Semester

• Complete balance of formal coursework
• PLBIO 600: Thesis research (1 – 9 credits)
• Hold Program Planning Meeting (if not held in Third Semester)
• Schedule and complete comprehensive exam (recommended)

Fifth and Later Semesters

• PLBIO 600: Thesis Research (1 – 9 credits), if comprehensive exam not passed
• PLBIO 601: Ph.D. Dissertation Full-Time (0 credits), if comprehensive exam passed in a previous semester
• Hold a Ph.D. committee annual meeting every year
• Present a research seminar in the Plant Biology Seminar series (recommended)
• Write dissertation and prepare manuscripts for submission to journals
• Schedule public dissertation seminar and final oral exam with the Ph.D. committee

The following recommended schedule is for students who enroll in Spring 2025.

First Semester

• Take formal coursework:
  PLBIO 513: Integrative Plant Communication and Growth (4 credits)
  PLBIO 516: Plant Molecular Biology (2 credits)
  PLBIO 590: Colloquium (1 credit)
  PLBIO 596: Individual Studies (2 credits)
  Appropriate English courses if required (international students)
• Identify potential areas for dissertation research
• Select and appoint dissertation advisor, if identified

Second Semester

• Take formal coursework:
  PLBIO 512: Plant Resource Acquisition and Utilization (4 credits)

PLBIO 515: Plant Cell Biology (2 credits)

PLBIO 590: Colloquium (1 credit)

PLBIO 596: Individual Studies (1 credits)

MCIBS 591: Ethics, Rigor, Reproducibility and Conduct of Research in the Life Sciences (2 credits)

Appropriate English courses if required (international students)

• Select and appoint dissertation advisor by the Semester end (if not identified in First Semester)

Third Semester, Fourth Semester, and Fifth and Later Semesters

Refer to the corresponding semester of the schedule above.

SECTION IV: THE MASTER OF SCIENCE DEGREE IN PLANT BIOLOGY

The Master of Science (M.S.) in Plant Biology is research based. The objectives are to enhance understanding of an area of science beyond the baccalaureate level and to attain scientific research skills. M.S. students are considered novice researchers and may require considerable guidance in choosing and executing their thesis research projects. However, upon completion of the M.S. degree, students should have developed some capacity for independent research. The M.S. degree is usually completed in two years, including course work and writing an M.S. thesis based on the student's research.

The Fox Graduate School Requirements

To earn an M.S. in Plant Biology, you must complete a minimum of 30 credits. At least 20 of these credits must be earned at the University Park campus. These credits are broken down as follows:

- A minimum of 12 credits of coursework in the major area at the 400 or 500 level
- A minimum of 18 credits at the 500 or 600 level, including at least 6 credits of thesis research
- A minimum of six credits in minor (if minor is selected)
- Final oral examination and thesis

Plant Biology Program Requirements

The Plant Biology Program requirements for an M.S. degree are contained within the Core Courses heading of Section II.

Transfer of Credits

You may transfer a maximum of 10 credits of previous graduate course work to Penn State. All transfer credits must have been earned at accredited institutions within five years of the first registration at Penn State. Credits earned to complete a previous M.S. degree may not be applied toward a second M.S. at Penn State. Forms for transfer of credit may be obtained from the Huck Graduate Programs Office or from Graduate Enrollment Services in 114 Kern Building. The Program Chair and Director of Graduate Enrollment Services must approve any transferred credits.

Written Diagnostic Examination

As part of the core courses for any degree in the Plant Biology Program, all students must enroll in two tutorial courses, PLBIO 512 and PLBIO 513. A member of the Plant Biology Program faculty coordinates each of these courses. Students are presented with advanced lectures in central areas of plant biology and prepare four written solutions to problems per semester, which form a dossier of papers that will constitute the written diagnostic exam for the M.S. degree. The papers and presentations are evaluated for ability of the student to reason and demonstrate understanding and knowledge of the topics, as well as creativity.

At the end of the second semester, the faculty coordinator of PLBIO 512 and the faculty coordinator of PLBIO 513 will each present a summary and evaluation of the student's progress to the Program Chair, who will then decide if the student has passed the written diagnostic exam.

Appointment of Master of Science Committee

Committee Structure

The M.S. committee must have at least three members chosen from the Plant Biology Program Faculty. Your thesis advisor will serve as the Chair of the committee. A list of Plant Biology faculty members may be found at https://www.huck.psu.edu/graduate-programs/plant-biology/people/faculty.

With the approval of the Program Chair, you may appoint one or more faculty members from outside the Plant Biology Program to serve as Outside Field Member(s) of your committee. The Outside Field Member(s) must participate in the final oral exam and must sign the exam documents and the final thesis.

The duties of the advisor and the committee for the M.S. program are to assist the student in planning a program of study, and to guide and encourage the student toward excellence in the chosen field. They will administer the final oral exam and approve the thesis.

Procedure for Master of Science Committee Appointment

Appointing a Master of Science Committee is an internal process, done through the Huck Graduate Programs Office. To assemble a committee, you should consult with your advisor to select appropriate faculty members, and then contact them to determine whether they are willing and able to serve. After getting their agreements, you should contact the Huck Graduate Programs Office with the names of your committee members. This may be done in person, by telephone or by e-mail. The Office will add this information to its database.

Changes in Committee Membership

For various reasons, it may occasionally become necessary for you to make changes to the committee membership. To make any changes to an appointed committee, contact the Huck Graduate Programs Office. The office will update your committee information in its database.

Program Planning Meeting

When you have assembled your committee, you should schedule a program planning meeting to discuss your thesis proposal. The Program Planning Meeting should be held no later than your second semester of residence. Prior to your meeting, you should extract the Thesis Proposal Approval Form from this Handbook (found in Appendix V under Section VI).

At least two weeks before your meeting, you should distribute a copy of your thesis proposal to your committee members. The proposal should not exceed 20 pages (excluding the title page, table of contents, and references), and should include a brief literature review, hypotheses to be tested, objectives and experimental plans, and any results obtained. At the beginning of the meeting, you will give an oral presentation of your proposed research. The committee will determine your strengths and weaknesses in the subject matter areas through questioning and informal discussion. The discussion will center on the proposal, e.g., feasibility of the proposed research and quality of the results obtained. The committee will review and make any necessary modifications to the proposal. The proposal may be approved, approved pending revision, or not approved. All committee members must sign the Thesis Proposal Approval Form, indicating the collective decision of the committee. You should also sign the form and return the completed form to the Huck Graduate Programs Office.

If major changes to the proposal are required, or if the proposal is not approved, you should discuss the necessary changes with the individual committee members and revise your proposal in accordance with their comments/suggestions. You should then provide the committee

members the revised proposal for review and approval. This should be completed within one month of the original meeting. If necessary, contact the Huck Graduate Programs Office for another copy of the typed Thesis Proposal Approval Form.

Application for Graduation

You must have your name placed on the graduation list for the appropriate semester in order to graduate. Notifying the Fox Graduate School is achieved through the "Apply for Graduation" process which can be done through LionPATH at https://lionpath.psu.edu. There is a deadline to file your "Apply for Graduation", and it falls early in each semester. The deadline date varies by semester and can be found on the Thesis, Dissertation, Performance and Oral Presentation Deadlines Calendar website (see Appendix I under Section VI) or by contacting the Huck Graduate Programs Office. When you believe that you will be ready to graduate, it is best to file your application with the Fox Graduate School. It is much easier to remove your name from the graduation list than to get it added on after the deadline!

Final Oral Examination

On completion of the academic program and thesis, the M.S. committee will administer the final oral exam. Before you schedule your final oral exam, you should confer with your thesis advisor to ascertain that your thesis research is essentially complete. You will also need to contact the Huck Graduate Programs Office to confirm that all other requirements for the M.S. degree have been met.

You should then consult with all your committee members and choose a mutually agreeable date and time. It is also up to you to reserve a meeting location if the exam will be conducted fully in-person or in hybrid mode. If the exam will be conducted in hybrid mode or fully-remote, your advisor will set up a remote meeting room and inform everyone else of the URL link prior to the exam. When everything is decided upon, you should contact the Huck Graduate Programs Office with this information. The exam must be scheduled at least three weeks in advance of the desired date.

The M.S. final exam may not be combined with the qualifying exam for the Ph.D. degree.

Distribution of Thesis Final Draft

Copies of the final draft of your thesis should be distributed to all the committee members at least two weeks prior to the scheduled exam. The distribution of the thesis copies is very important, as your committee members must be allowed time to critically read and examine your thesis before the final oral exam.

Public Thesis Seminar

It is highly recommended that you give a public thesis seminar. If you plan to do so, you should schedule the seminar through the Huck Graduate Programs Office so that a seminar announcement can be prepared and distributed electronically. The thesis seminar is usually immediately followed by a closed-door oral exam by your thesis committee.

Closed-Door Final Oral Examination

This exam will determine the student's ability to defend the methods, findings, and conclusions of the thesis, and also determine the student's ability to relate the research findings to the pertinent literature. The possible results are:

PASS – A favorable vote of two-thirds of the committee members is required for a student to pass the final oral exam.

FAIL – The student has the option to retake the final oral exam one time at a date no later than 90 days following the first exam.

FAIL WITHOUT RE-EXAMINATION OPTION – This decision results in the termination of the student from the Plant Biology M.S. degree program.

The Huck Graduate Programs Office will provide the M.S. Committee with a Master's Thesis Defense Report form prior to the exam date. It is highly recommended that all committee members provide their ratings/comments and signatures on the Master's Thesis Defense Report form before leaving the exam. If any committee member participates remotely, the Chair of the committee will scan the partially filled form into a PDF file and send it to them for completion. The Chair must send the completed form to the Huck Graduate Programs Office.

Final Submission of Master of Science Thesis

Effective January 15, 2021 the deadline for final committee members' review/approval of theses/dissertations within the eTD site will be earlier in the semester to accommodate a change in the review process by the Office of Theses and Dissertations. The thesis should be reviewed by each committee member and changes finalized before the semester deadlines to allow for enough time for the Office of Theses and Dissertations to review and approve. Final review and approval of the thesis by the committee should be completed before uploading the final thesis (in a single PDF file) to the eTD site. No changes should be requested following the final submission to the eTD site. Deadlines for the student to upload the final thesis and committee members to electronically sign the final uploaded document are published in the Thesis, Dissertation, Performance and Oral Presentation Deadlines Calendar, which can be accessed by using the link listed in Appendix I under Section VI. For information on preparation and submission of theses electronically, visit: https://etda.libraries.psu.edu/. In some cases, the thesis advisor and thesis committee members may request a bound copy of the thesis. All costs for thesis typing, illustrations, and reproduction, as well as thesis submission and binding of the thesis (if applicable) are borne by the student.

Recommended Schedule for the M.S. Degree

The brief outline below describes a typical course of study. Specific details will vary depending on an individual student's advisor and committee recommendations. After completing the required one semester of PLBIO 590 (Colloquium), students are strongly encouraged to continue to attend the weekly Plant Biology Seminar series. During summer sessions students are expected to pursue thesis research and participate in regional, national, or international meetings as appropriate.

Please use the M.S. Checklist found in Appendix III under Section VI to keep track of your individual progress.

Prior to First Semester

• Identify a general area of interest and identify the thesis advisor

• Complete the CITI online RCR course and submit the Course Completion Report to Huck Graduate Programs Office, or via e-mail to Freya Heryla at fqh5144@psu.edu, by noon, August 20, 2024 (See Page 15, Section II).

First Semester

• Take formal coursework:

PLBIO 512: Plant Resource Acquisition and Utilization (4 credits)

PLBIO 590: Colloquium (1 credit); may be taken in Second Semester

MCIBS 591: Ethics, Rigor, Reproducibility and Conduct of Research in the Life Sciences (2 credits)

PLBIO 600: Thesis Research (1 – 9 credits)

Other courses as recommended by advisor

Appropriate English courses if required (international students)

- Select and appoint thesis advisor, if not identified prior to First Semester
- Develop a plan of study in conjunction with thesis advisor
- Identify an area for thesis research in conjunction with thesis advisor
- Identify members of the M.S. thesis committee

Second Semester

- Take formal coursework:

PLBIO 513: Integrative Plant Communication and Growth (4 credits)

PLBIO 590: Colloquium (1 credit), if not taken in First Semester

PLBIO 600: Thesis Research (1 – 9 credits)

Other courses as recommended by thesis advisor

Appropriate English courses if required (international students)

- Identify members of the M.S. thesis committee (if not done in First Semester)
- Schedule a Program Planning Meeting to discuss and develop a specific thesis topic and plan of action for its completion
- Develop a plan of study
- Discuss progress made in course work and any additional courses the committee feels are necessary
- Submit a detailed thesis proposal to the thesis committee before the end of Second Semester
- Begin working on thesis paper as early as appropriate

Third Semester

- PLBIO 600: Thesis Research (1 – 9 credits)
- Take formal coursework, if necessary
- Continue with work on thesis

Fourth and Later Semesters

- PLBIO 600: Thesis Research (1 – 9 credits); not required for the final semester
- Continue formal coursework as required to complete plan of study
- Complete thesis
- Schedule final oral exam with committee
- Present a thesis seminar in conjunction with the final oral exam

SECTION V: PLANT BIOLOGY COURSE OFFERINGS

The following is a list of courses offered by the Plant Biology Program in 2024-2025.

PLBIO 512: Plant Resource Acquisition and Utilization (4 credits)

Advanced study of plant resource acquisition and utilization considering molecular, physiological, and whole plant perspectives through lectures and problem solving

PLBIO 513: Integrative Plant Communication and Growth (4 credits)

Advanced study of plant communication, growth, and development considering molecular, physiological, and whole plant perspectives through lectures and problem solving

PLBIO 515: Modern Techniques and Concepts in Plant Cell Biology (2 credits)

An intensive introduction to concepts of plant cell biology and modern techniques used in this field

PLBIO 516: Modern Techniques and Concepts in Plant Molecular Biology (2 credits)

An intensive introduction to contemporary molecular biology methods as applied to the study of plants

PLBIO 590: Colloquium (1 – 3 credits)

PLBIO 596: Individual Studies (1 – 9 credits)

PLBIO 600: Thesis Research (1 – 15 credits)

PLBIO 601: Ph.D. Dissertation Full-Time (0 credits)

PLBIO 610: Thesis Research Off Campus (1 – 15 credits)

PLBIO 611: Ph.D. Dissertation Part-Time (0 credits)

SECTION VI: APPENDICES

Appendix I: Table of Useful Web Sites

Plant Biology Program	**101 Huck Life Sciences Building**
Plant Biology Program Web Site	http://www.huck.psu.edu/content/graduate-programs/plant-biology
For Program faculty and students, news, updates, information, and events	
Plant Biology Program Listserv® addresses	
List includes Plant Biology faculty, students and friends	L-Plant-Biology-Superlist@lists.psu.edu
List includes Plant Biology faculty only	L-Plant-Biology-Faculty@lists.psu.edu
List includes Plant Biology students only	L-Plant-Biology-Students@lists.psu.edu
The Fox Graduate School	**114 Kern Building**
The Fox Graduate School Home Page	http://www.gradschool.psu.edu
Important resources and information about the Fox Graduate School and its programs	
Graduate Bulletin	https://bulletins.psu.edu/graduate/
Graduate Education Policies	http://gradschool.psu.edu/graduate-education-policies/
Online resources for all Fox Graduate School information and requirements	
Graduate Calendar and Academic Deadlines	https://gradschool.psu.edu/academics/academic-dates-and-deadlines
A listing of academic deadlines for current and future semesters	
Fellowships and Student Financial Aid	https://gradschool.psu.edu/funding/funding-faq
Applications and information about funding opportunities	
Office of Theses and Dissertations	**115 Kern Building**
Thesis and Dissertation Guide	https://gradschool.psu.edu/assets/uploads/documents/Thesis-and-Dissertation-Handbook.pdf
Containing editorial requirements for M.S. Theses and Ph.D. Dissertations	
Thesis, Dissertation, Performance and Oral Presentation Deadlines Calendar	https://gradschool.psu.edu/academics/academic-dates-and-deadlines
For thesis and dissertation deadlines of the current semester	
Office of the University Registrar	**112 Shields Building**
Registrar's Office Home Page	http://www.registrar.psu.edu
For information on registration, transcripts and grades	
Registration Instructions	https://lionpathsupport.psu.edu/help/ http://www.registrar.psu.edu/registration
Detailed instructions on how to register for courses	
Office of the Bursar	**103 Shields Building**
Bursar's Office Home Page	http://www.bursar.psu.edu
Billing Due Dates	http://www.bursar.psu.edu/duedates
eRefund	http://bursar.psu.edu/refund-policy
Information on tuition, fees, semester bills, due dates, room & board rates, and more	
LionPATH	https://www.lionpath.psu.edu
Online course registration, access to transcripts, grades, and more	
Graduate and Professional Student Association	**315H Hub-Robeson Center**
GPSA Home Page	http://gpsa.psu.edu/

APPENDIX II: Ph.D. DEGREE CHECKLIST

Please use this checklist to keep track of your progress.

Requirement or Action	Timeframe or Deadline	Notes and Instructions	Completed
Discuss course of study	Huck Graduate Programs Orientation	Program Chair will describe the curriculum and important issues concerning graduate study.	
Obtain a copy of Plant Biology Student and Faculty Handbook	Huck Graduate Programs Orientation	Also available online on the Plant Biology Program website	
Register for and take CITI online RCR course	Before or during Huck Graduate Programs Orientation; must submit the Completion Report to Huck Graduate Programs Office by noon, August 20, 2024	Students must work independently to complete the modules and pass the online quizzes.	
Take PLBIO 512: Plant Resource Acquisition and Utilization	Must take during first fall semester	Challenge problem papers for this course and PLBIO 513 form the basis of the qualifying exam.	
Take PLBIO 513: Integrative Plant Communication and Growth	Must take during first spring semester	Challenge problem papers for this course and PLBIO 512 form the basis of the qualifying exam.	
Take PLBIO 515: Plant Cell Biology	Must be completed by the end of fourth semester	One of two modules of the jumpstart course. May be taken in any sequence.	
Take PLBIO 516: Plant Molecular Biology	Must be completed by the end of fourth semester	One of two modules of the jumpstart course. May be taken in any sequence.	
Take all other required courses: PLBIO 590, PLBIO 596 and MCIBS 591	Must be completed by the end of second semester	MCIBS 591 is offered in both semesters, but students are strongly encouraged to take it in the Fall.	
Appoint Dissertation Advisor	After completing laboratory rotations; no later than the end of the second semester	Inform Huck Graduate Programs Office of this information.	
Take the Oral Qualifying Exam	Must pass by the end of third semester (i.e., second fall semester)	**Paperwork needed! Signatures required!** Contact Huck Graduate Programs Office with date, time, location, and names of all qualifying exam panel members.	
Appoint Ph.D. Committee	Within one calendar year after passing oral qualifying exam	**Paperwork needed! Signatures required!** Provide Huck Graduate Programs Office names of committee members; the Office then prepares the signature form in Adobe Sign for student, committee members and Program Chair to sign electronically.	
Hold Ph.D. Committee Annual Meeting	After appointment of Ph.D. committee and formulation of a dissertation research plan	Prepare a summary of research or research plan for distribution to Ph.D. committee prior to meeting, and prepare a presentation for meeting. Extract the Ph.D. Committee Annual Meeting Form from this Handbook.	
Hold Program Planning Meeting	Within two semesters after passing qualifying exam; this meeting is	Prepare a dissertation proposal for distribution to committee prior to meeting. Extract the Dissertation	

	optional, but is highly recommended, and would be considered a Ph.D. committee annual meeting	Proposal Approval Form from this Handbook. **Allow 3 workdays.** Committee meets to review and approve dissertation research proposal.	
Submit signed Dissertation Proposal Approval Form	Immediately after dissertation research proposal is approved by Ph.D. committee	Email a PDF file of the Dissertation Proposal Approval Form, signed by all Ph.D. committee members and you, to Huck Graduate Programs Office.	
Schedule and take Comprehensive Exam	After completing all the required course work, and must be scheduled no later than five years following passing of qualifying exam	**Paperwork needed! Signatures required!** This exam is scheduled by Huck through the Fox Graduate School. Contact Huck Graduate Programs Office with date, time, and location. **Allow 3 weeks.** All Ph.D. committee members must participate. Student is responsible for reserving room.	
Schedule and present research seminar(s) in the Plant Biology Seminar series	After obtaining a substantial amount of results in dissertation research; additional seminars may be given later, if warranted	Consult with dissertation advisor about the timing of seminar; schedule the seminar with the coordinator of the Plant Biology Seminar series.	
Apply for Graduation	Early in desired semester; deadline varies by semester	Done through LionPATH at: https://www.lionpath.psu.edu	
Schedule and take Final Oral Exam and give a public dissertation seminar	Schedule when ready to defend dissertation. Must pass before deadline for graduation in same semester; deadline varies by semester	**Paperwork needed! Signatures required!** This exam is scheduled by Huck through the Fox Graduate School. Contact Huck Graduate Programs Office with date, times and locations of public seminar and oral exam. **Allow 3 weeks!** All Ph.D. committee members must participate. Student is responsible for reserving room.	
Distribute dissertation final draft to committee members	At least two weeks prior to final oral exam		
Submit dissertation to Office of Theses and Dissertations for format review	During semester of defense; deadline varies by semester	Submit dissertation online according to instructions at: https://gradschool.psu.edu/academics/theses-and-dissertations/submission-procedure	
Submit final dissertation electronically to the Fox Graduate School	After dissertation has incorporated changes required by Ph.D. committee and by Office of Theses and Dissertations	The committee applies their official signatures in the eTD system after the final dissertation has been uploaded. In some cases, dissertation advisor may request a bound copy of dissertation.	

APPENDIX III: M.S. DEGREE CHECKLIST

Please use this checklist to keep track of your progress.

Requirement or Action	Timeframe or Deadline	Notes and Instructions	Completed
Discuss course of study	Huck Graduate Programs Orientation	Program Chair will describe the curriculum and important issues concerning graduate study.	
Select and appoint Thesis Advisor	Prior to or soon after arrival		
Obtain a copy of Plant Biology Student and Faculty Handbook	Huck Graduate Programs Orientation	Also available online on the Plant Biology Program website	
Register for and take CITI online RCR course	Before or during Huck Graduate Programs Orientation; must submit the Completion Report to Huck Graduate Program Office by noon, August 20, 2024	Students must work independently to complete the modules and pass the online quizzes.	
Take PLBIO 512: Plant Resource Acquisition and Utilization	Must take during first fall semester	Challenge problem papers written for this course and PLBIO 513 constitute the written diagnostic exam.	
Take PLBIO 513: Integrative Plant Communications and Growth	Must take during first spring semester	Challenge problem papers written for this course and PLBIO 512 constitute the written diagnostic exam.	
Accumulate at least 30 graduate credits, including all other required courses (PLBIO 590 and MCIBS 591)		A minimum of 18 credits at the 500 or 600 level, including at least 6 credits of thesis research; at least 12 credits in course work at the 400 or 500 level	
Appoint M.S. Thesis Committee	By the end of first spring semester	Inform Huck Graduate Programs Office of names of committee members; minimum of three members required.	
Hold Program Planning Meeting	During first spring semester	Extract the Thesis Proposal Approval Form from this Handbook. Committee meets to review and approve thesis research proposal.	
Submit signed Thesis Proposal Approval Form	Immediately after thesis research proposal is approved by M.S. committee	Email a PDF file of the Thesis Proposal Approval Form with signatures of all committee members and your signature to Huck Graduate Programs Office.	
Apply for Graduation	Early in desired semester; deadline varies by semester	Done through LionPATH at: https://www.lionpath.psu.edu	
Schedule Final Oral Exam	When ready to defend thesis; must pass before deadline for graduation in same semester; deadline varies by semester.	**Paperwork needed! Signatures required! Allow 3 weeks!** Contact Huck Graduate Programs Office with date, time, and location of the exam. All M.S. committee members must participate. Student is responsible for reserving room.	
Distribute thesis final draft to committee members	At least two weeks prior to final oral examination		
Submit thesis to Office of Theses and Dissertations for format review	During semester of defense; deadline varies by semester	Submit thesis online according to instructions at: https://gradschool.psu.edu/academics/theses-and-dissertations/submission-procedure	
Submit thesis electronically to the Fox Graduate School	After thesis has incorporated changes required by M.S. committee and by Office of Theses and Dissertations	The committee applies their official signatures in the eTD system after the final thesis has been uploaded. In some cases, thesis advisor may request a bound copy of thesis.	

APPENDIX IV:
DISSERTATION PROPOSAL APPROVAL FORM

Program Planning Meeting
Intercollege Graduate Degree Program in Plant Biology

Title of Dissertation Proposal: _____

_____

Committee Member	Printed Name	Signature
Chair (Program Member)	_____	_____
Co-Chair (if applicable)	_____	_____
Dissertation Advisor (Identify and sign even if signing elsewhere on form)	_____	_____
Major Program Member	_____	_____
Major Program Member	_____	_____
Major Program Member	_____	_____
Outside Field Member	_____	_____
Outside Unit Member	_____	_____
Student	_____	_____

Committee Decision on Proposal

Approved: _____ Approved Pending Revision: _____ Not Approved: _____

Date: _____

APPENDIX V:
THESIS PROPOSAL APPROVAL FORM

Program Planning Meeting
Intercollege Graduate Degree Program in Plant Biology

Title of Thesis Proposal: _____

_____

Committee Member	Printed Name	Signature
Chair (Thesis Advisor)	_____	_____
Major Program Member	_____	_____
Major Program Member	_____	_____
Major Program Member	_____	_____
Outside Field Member	_____	_____
Student	_____	_____

Committee Decision of Proposal

Approved: _____ Approved Pending Revision: _____ Not Approved: _____

Date: _____

APPENDIX VI:
PH.D. COMMITTEE ANNUAL MEETING FORM

Intercollege Graduate Degree Program in Plant Biology

Student: _____ Date of Meeting: _____

Title of Dissertation: _____

_____

Committee Member	Printed Name	Signature
Committee Chair	_____	_____
Co-Chair (if applicable)	_____	_____
Dissertation Advisor	_____	_____
Major Program Member	_____	_____
Major Program Member	_____	_____
Major Program Member	_____	_____
Outside Field Member	_____	_____
Outside Unit Member	_____	_____

Committee Evaluation of Student's Research Progress:

Satisfactory Progress _____ Unsatisfactory Progress _____

The Dissertation Advisor should prepare a summary of the committee's comments and suggestions, and provide PDF files of the signed form and summary to the student, all committee members, and Freya Heryla, fqh5144@psu.edu, of the Huck Graduate Programs Office.

Student Signature _____

APPENDIX VII:
TRAVEL SUPPORT REQUEST FORM

Intercollege Graduate Degree Program in Plant Biology

DATE OF REQUEST: _____

STUDENT'S NAME: _____

SIGNATURE: _____

STUDENT ID: _____

FACULTY ADVISOR: _____

DEGREE SOUGHT: _____

TRAVEL DATES: _____

DESTINATION(S): _____

REASON FOR TRAVEL:

MEANS OF TRANSPORTATION: _____

AMOUNTS REQUESTED FOR

TRANSPORTATION: _____; LODGING: _____; REGISTRATION: _____

TOTAL AMOUNT REQUESTED: _____

PROGRAM CHAIR APPROVAL: _____

APPROVED AMOUNT: _____

APPENDIX VIII: THESIS AND DISSERTATION RESOURCES

Information on thesis and dissertation requirements and submission, forms, payment of thesis and dissertation fees, graduate workshop registration, the Fox Graduate School Commencement, eTD (electronic theses and dissertations): Office of Theses and Dissertations 115 Kern Building University Park, PA 16802 Phone: (814) 865-5448 E-mail: gradthesis@psu.edu Web sites: https://etda.libraries.psu.edu http://www.gradschool.psu.edu/current/thesis.html	Information on scheduling doctoral and master's exams, appointing or changing Ph.D. and M.S. committees, completion of the Fox Graduate School requirements, letters of certification: Graduate Enrollment Services 114 Kern Building University Park, PA 16802 Phone: (814) 865-1795 E-mail: gradschoolapp@psu.edu for Admissions E-mail: gesrecords@psu.edu for Records
Thesis and dissertation copying and binding services: Multimedia & Print Center 101 Hostetter Business Services Building University Park, PA 16802 Phone: (814) 865-7544 Web site: http://www.multimediaprint.psu.edu	One-on-one consultations for students working on any writing project. For in-person or Zoom appointments, visit https://secure.gradsch.psu.edu/wccal/ The Graduate Writing Center Web site: https://gwc.psu.edu/
Transcripts, diplomas, official name change, student records, change of address: Office of the University Registrar 112 Shields Building University Park, PA 16802 Phone: (814) 865-6357 E-mail: registrar@psu.edu Web site: http://www.registrar.psu.edu	Review/approval of the use of human subjects, vertebrate animals, bio-hazardous materials or radioisotopes: Office for Research Protections Suite 205, The 330 Building University Park, PA 16802 Phone: (814) 865-1775 Web site: http://www.research.psu.edu/orp