

TRANSLATIONAL PLANT SCIENCES
GRADUATE PROGRAM HANDBOOK
2021-2022

**TPS Graduate Coordinators for
the academic year 2021-2022**

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SECTION I

OVERVIEW OF TPS GRADUATE PROGRAM REQUIREMENTS

A. GRADUATE STUDENT ORIENTATION

All new TPS students are expected to attend activities for the TPS and Graduate School orientations, held the week before classes begin in the Fall. Activities include presentations on the academic details of the program, information sessions on research programs and development of rotation schedules, assignment of peer mentors, and social events to help participants become acquainted. In addition, students will attend laboratory safety sessions, many of which are held in online modules, to prepare for rotations. Additional training will be covered by individual rotation laboratories.

B. THE FIRST YEAR

1. Coursework

The following plan of study is suggested for students entering the TPS program in the 2021-2022 academic year:

Fall 2021. Choose required courses in green and 1-2 courses from additional suggested courses. Other additional courses may be selected after consulting with the TPS Graduate Coordinators. Total course load should be 12-15 hours.			
Course Number	Title	Credits	Requirement
ALS 5324	Research Ethics Ag & Life Sciences	P/F = 1h	Required
GRAD 5515	Molecular Plant Science Rotations	A/F = 3h	Required
ALS/BCHM/BIOL/PPWS 5064	Seminar in Mol Cell Biology & Biotech (VTLSS)	P/F = 1h	Required
GRAD 7994	Research and Dissertation; EQ	EQ= variable	Required
GRAD 5004	Graduate Teaching Workshop	P/F = 1h	Suggested
BCHM 5124	Biochemistry for the Life Sciences	3h	Suggested
STAT 5605	Biometry	3h	Suggested
STAT 5615	Statistics in Research	3h	Suggested
BIOL 5884	Molecular Biology of the Cell	3h	Suggested
ALS 5224	Introduction to Genomic Analysis	3h	Suggested

Spring 2022. Choose required courses and 1-2 courses from additional suggested courses. Other additional courses may be selected after consulting with the TPS Graduate Coordinators. Total course load should be 12-15 hours.

Course Number	Title	Credits	Requirement
GRAD 5134	Topics in Interdisciplinary Research - Trans Plant Sci	A/F = 3h	Required
GRAD 5516	Molecular Plant Science Rotations	A/F = 3h	Required
ALS/BCHM/BIOL/PPWS 5064 or BIOL5174	Seminar in Mol Cell Biology & Biotech (VTLSS) or Seminars Across the Sciences	P/F = 1h	Required
GRAD 5134	Translational Plant Science	3h	Required
GRAD 7994	Research and Dissertation; EQ	EQ = variable	Required
GRAD 5004	Graduate Teaching Workshop	P/F = 1h	Suggested
PPWS 5234	Applied Statistics for Plant and Environmental Scie	3h	Suggested
BCHM/PPWS 5344	Molecular Biology for the Life Sciences	3h	Suggested
BIOL 5344	Advanced Chemical Ecology	3h	Suggested
CSES 5844	Plant Genomics	3h	Suggested
PPWS 5534	Advanced Plant Physiology and Metabolism II	3h	Suggested

*A/F indicates that a letter grade is given in this course; P/F means it is graded pass/fail.

**This plan may be modified according to the academic background, training, and specific interests of the student. In addition, course availability may vary from year to year. Research and Dissertation credits are used, when necessary, to adjust the total to 12. TPS students are also required to enroll in one seminar course each semester (the VTLSS seminar in the first semester).

2. Laboratory Rotations

To become familiar with the research programs in the Translational Plant Sciences at Virginia Tech and to help with the selection of an advisor (major professor) and dissertation project, students will participate in 6-week laboratory rotations in the fall and spring semesters of the first year. At the end of each rotation, formal presentations describing the results of the research projects will be given by each student; these presentations are open to the TPS community, with required attendance by all first-year TPS students, rotation advisors, and the TPS Graduate Coordinators. Grades will be assigned on an A/F scale based on performance in the laboratory and the oral presentation. The choice of a permanent ("home") lab may be made at any time during the first year, but students should rotate in at least three different laboratories, unless they have already obtained a master's degree in a plant sciences area and have consulted with the TPS Graduate Coordinators. Students will submit requests for rotation assignments during orientation week; rotation schedules will be developed by the TPS Graduate Coordinators to best match student interests with rotation opportunities in individual laboratories.

3. Evaluation

Enrollment in graduate programs and financial support are contingent on satisfactory progress toward the degree. TPS students will be evaluated by the TPS Graduate Coordinators (in consultation with the rotation advisors) at the end of the Fall and the Spring semesters.

The grade breakdown for each rotation is as follow:

7 pts for attending/preparing/reviewing practice talk

14 pts for presenting practice talk

29 pts for supervisor's evaluation

Total 50 pts

4. Selection of Advisor and Home Department

TPS students must select a major advisor by the end of the spring semester of the first year. Each student will submit a ranked list of preferences to the TPS Graduate Coordinators. Students are encouraged to base their preferences on discussions with all relevant faculty; choices are not limited to faculty with whom rotations were performed. Every effort will be made by the Graduate Coordinators to accommodate student preferences, within the limits of resources available in individual laboratories.

The departmental affiliation of the advisor will determine the student's home department. For the remainder of the student's graduate program, their Ph.D. degree requirements will be dictated by the Ph.D. requirements for their home department. By and large these requirements are quite similar across the university, though the specific details may differ in each department. Students must then assemble an advisory committee according to the requirements of their home department, which is typically composed of their advisor and three to four additional members. The committee should meet prior to the first day of classes of the spring semester to review the Plan of Study for the second and subsequent years.

C. SUBSEQUENT YEARS

1. Prospectus and Plan of Study

The student will work with their advisor to develop a suitable dissertation project, and will then write a formal research prospectus according to the requirements of their home department. This prospectus, together with a formalized Plan of Study, must be presented to the student's committee before the end of the Fall semester of the second year (the third semester of enrollment). Note that different departments differ somewhat in their requirements for the Plan of Study. Each student is responsible for incorporating specific departmental requirements into the Plan of Study. Under certain circumstances (e.g. undergraduate coursework deficiencies), the student may be required to take undergraduate level courses that may not count towards fulfillment of Ph.D. coursework. These situations will be handled on a case-by-case basis with input from the student, his/her advisor and advisory committee, and the TPS Graduate Coordinators.

2. Other Requirements for the Ph.D. Degree

Other than these activities, starting with the summer of the first year all requirements for the Ph.D. degree will be according to the Policies and Procedures of the student's home department, including specific course requirements, timing of the preliminary exam, and evaluation of adequate progress toward the degree in subsequent years. Students will be required to meet departmental expectations for assignments as teaching assistants. The GTA workshop (GRAD5004) should be taken in advance of serving as a GTA.

SECTION II

POLICIES AND PROCEDURES

A. GRADUATE PROGRAM STRUCTURE

1. Graduate Selection Committee

The committee consists of faculty representatives from each of the participating departments (Biochemistry; Biological Sciences; Biological Systems Engineering; Forestry; School of Plant and Environmental Sciences (include former departments of Crop Soils and Environmental Sciences; Horticulture; Plant Pathology, Physiology, and Weed Science). The committee reviews graduate student applications, arranges interviews, and makes the final selection of candidates for the program, and in some cases with the approval of the heads/chairs and graduate Coordinators of the participating departments.

2. Graduate Evaluation

The TPS Graduate Coordinators reviews the progress of each TPS student at the end of the Fall and the Spring semesters, as described below, to determine whether satisfactory progress is being made toward the degree. The Coordinators will also be responsible for making rotation assignments in the Fall and Spring semesters of the first year.

3. Faculty Participation in the Graduate Program

The major advisor serves as chair of the student's advisory committee. Only tenured or tenure-track faculty are eligible to serve as chairs (or co-chairs). The chair of the student's Advisory Committee has the primary responsibility for directing the student's research and providing the guidance needed for the student to fulfill the requirements of his or her degree program. This individual must also be able to provide support in the form of GTA or GRA's for the expected duration of the degree program, including summer sessions, up to the limits set by the Graduate School or Department. The remaining members of the Advisory Committee should be selected according to the guidelines of the student's home department. The Chair of the Advisory Committee will write an evaluation of the student's progress at the end of the first nine months, summarizing the consensus opinion of the committee.

Committee Changes: There are legitimate, academically appropriate circumstances when changes in a student's Advisor or Advisory Committee should be made. In all cases, these must be made with the agreement of all parties involved and in accordance with graduate school policies. In addition, the earlier these changes occur, the greater the academic benefit to the student.

B. GRADUATE ADMISSIONS

1. Processing of Applications

Applications are submitted electronically to the Graduate School. When complete, each application is logged in and made available to the TPS Graduate Recruitment Coordinators. The Recruitment Coordinators then makes the application available to all participating TPS faculty for feedback. All of the applications are then evaluated by the TPS Graduate Selection Committee, which is made up from at least one representative from each of the participating departments. At this stage, a short list of candidates is developed and an interview is scheduled. If a personal interview is not possible, a phone interview will be conducted by at least three TPS faculty, including one member of the Graduate Selection Committee. A second round of faculty comments are solicited based on the interviews. The TPS Graduate Selection Committee then makes the final decisions on extending offers to individual candidates based on the candidates' acceptability for the program and the number of slots available for the coming year.

2. Admission Requirements

Applicants must meet the following minimum standards:

- a. GPA \geq 3.0 for the last two years or 60 credit hours of undergraduate coursework.
- b. Background coursework in the field of interest.
- c. In the case of international, non-native English-speaking applicants, TOEFL scores of at least 600 on the paper based test or 100 on the computer-based test.
- d. References indicating aptitude for graduate studies, especially for research.

3. Graduate Status

All students in the TPS graduate program enter directly into a Ph.D. program. M.S. degrees will be awarded only in situations where a student does not pass the preliminary examination in two attempts, or if extenuating circumstances arise.

C. DEGREE REQUIREMENTS

General requirements for M.S. and Ph.D. degrees at Virginia Tech are described in the Graduate Catalog (https://secure.graduateschool.vt.edu/graduate_catalog/). The following degree requirements apply to all TPS graduate students.

1. Plan of Study and Prospectus

A Plan of Study should be approved by the Graduate Advisory Committee and filed through the home department prior to completion of the second semester of graduate coursework as a full-time student (i.e. by the end of the first spring semester).

Courses included on the Plan of Study are those needed for the student's academic development and specific research field, and to remedy any background deficiencies as determined by the student's committee in accordance with departmental policies. The Ph.D. degree requirements differ among the seven departments participating in the TPS program; students must meet the requirements of their home department (i.e., the one in which their major advisor resides).

By the end of the third semester of graduate coursework (i.e. by the end of fall semester of the second year), the student must present a dissertation prospectus. This document must meet the standards of the student's home department, but typically includes a title, brief description of the project (including objectives or hypotheses to be tested), relevance of the project to the literature, and an outline of the experimental design and methods that will be used to meet the stated objectives, and any preliminary data that may have been generated.

The Advisory Committee members' signatures on the student's Plan of Study signify that the student has presented his/her research prospectus to the committee as a whole and that they agree on the adequacy of the research program and the proposed coursework in relation to the student's degree objectives and background.

2. Portfolios

Each student must keep a current professional curriculum vitae in his/her TPS program file. Depending on the home department, each student will present his/her curriculum vitae, plan of study, prospectus, and final dissertation in paper format and/or as files of an electronic portfolio, which can be accessed by the advisory committee and the departmental graduate director.

3. Committee Meetings

The Advisory Committee of each graduate student should meet once prior to the completion of the third semester in the program (i.e., by the end of the second fall semester). The purpose of the meeting is to review the student's progress toward the degree and begin to develop a research plan and a Plan of Study. Further committee meetings are scheduled according to the departmental and graduate school policies.

At the first meeting the student should report to the committee on their progress toward the degree and future plans. This report should include any progress in research and coursework activities, teaching activities (including any student or supervisor evaluations that are available), and information about involvement in professional activities. After a discussion between committee members and the student, about progress and any problems, the student will be asked to leave the room for the committee members to develop an evaluation. The evaluation is conveyed to the student in oral form and they are given an opportunity to respond.

After the meeting, the Advisory Committee Chair will draft a letter addressed to the student reflecting the committee evaluation. This letter should describe the ways in which a student is making satisfactory progress and outline any problem areas as well as expectations for future performance in coursework, research, and teaching. Unsatisfactory progress should also be documented, along with expectations for improvement; the Advisory Committee may also recommend that the student be terminated if expectations for improvement established in a previous semester have not been met.

Copies of the letter will be sent to all committee members and placed in the student's permanent department files. These letters provide the most important source of information about graduate progress toward degrees. Any student who feels that they have been misjudged or that important information was lacking in the evaluation should present arguments and/or supporting evidence in writing to their committee and place a copy in their TPS and department files.

4. Preliminary Examination

Each Ph.D. student must take a preliminary examination conducted by their Advisory Committee and designed to test the student's mastery of the doctoral field of study. This examination will be conducted according to the policies of the department with which the student becomes affiliated. The exam is typically taken before the end of the second year in the program; Virginia Tech requires that it take place at least six months prior to completion of the degree.

5. Dissertation

A written dissertation is required for all Ph.D. degrees granted by departments participating in the TPS graduate program. This document must meet the requirements of the student's home department.

Note that Virginia Tech requires that all students submit their dissertation electronically; complete instructions are available at <http://etd.vt.edu/>. A bound hard copy of the dissertation must also be provided in most cases to the student's home department. Typically, the student is responsible for all costs connected with production of the required copies of the dissertation.

It is University policy that data collected while a student (or other researcher) is at Virginia Tech is the property of the University. This includes notebooks containing original data, copies of the dissertation, and manuscripts submitted for publication. Arrangements must be made with the Chair of the Advisory Committee to copy any material that the student wishes to take with them following departure from the University.

6. Seminar Requirements

Each semester they are in residence, TPS graduate students are expected to be enrolled Pass/Fail in a seminar course and attend the weekly seminars every semester that they are in residence. Ph.D. students typically must also present two formal seminars during their graduate residence; this requirement will be determined by the student's home department.

7. Teaching Requirement

The departments participating in the TPS graduate program all require that Ph.D. students serve as a Graduate Teaching Assistant for at least one semester while enrolled at Virginia Tech. Additional teaching may be required, depending on the degree requirements of the home department and type of assistantship. All international teaching assistants who will have teaching responsibilities (in classes or labs) must be tested for oral competency before beginning their assignment. This can consist of either the SPEAK Test (an institutional version of the Test of Spoken English) or the TEACH Test (mini-lecture in the student's field).

8. Foreign Language Requirement

Proficiency in a foreign language is not mandated by the TPS program; students must meet the proficiency requirements of their home department.

9. Out-Of-Date Coursework Revalidation

Academic work, including transfer credit, taken more than seven years before the date at which the Ph.D. degree is awarded is considered out-of-date. Such coursework may be revalidated upon petition and approval of the student's home department and the Graduate School under some conditions.

10. Final Examination

Each TPS graduate student must pass a final oral examination which includes, but need not be limited to, a defense of the dissertation. The format of this examination will be determined by the policies and procedures of the student's home department. In general, requests to schedule the final examination, and the terminal seminar that precedes it, should be approved by the Department Head and sent to the Graduate School at least two weeks prior to the examination date requested. Graduates planning to participate in spring or winter commencement exercises must meet specific deadlines published by the Graduate School. Final examinations must be given during regular academic sessions.

D. REVIEW OF PROGRESS TOWARD THE DEGREE

All first-year students are evaluated to ensure that they are making satisfactory progress toward the degree based on the results of coursework and participation in the rotation program (Graduate Policies and Procedures and Course Catalog, "Satisfactory progress"). Based on evaluations by the rotation advisors, rotation presentations, and course performance, the Graduate Coordinators will write a letter to each student summarizing the evaluation, including recommendations for improvement in the event that a student's progress is deemed unsatisfactory. This letter will become part of the student's permanent file.

At the end of the second semester, the Graduate Coordinators will again write a letter to each student, which will become part of the student's permanent file. Additional relevant information in the student's file (professional activities, grade reports, Plan of Study, earlier evaluation letters, student evaluations of GTA performance) will also be used in this assessment.

The Graduate Coordinators may recommend termination of a student for lack of improvement following recommendations made in January. In this case, the decision to terminate the student will be reviewed by an TPS Graduate Evaluation Committee consisting of faculty of several departments including the Graduate Coordinators and the Heads/Chairs of the participating departments before (a) making the recommendation of termination to the Graduate School or (b) allowing the student one semester to find a new advisor and establish a new Advisory Committee (see GA requirements below). These procedures will insure the student's right to appeal at every level as specified by Graduate School policy (Graduate Policies and Procedures and Course Catalog, "Graduate Student Appeal").

E. FINANCIAL ASSISTANCE

1. Initial Support

Generally, support for the first nine months of study is provided in the form of Graduate Research Assistantships. Incoming students have identified a home department, funding will be awarded by the appropriate department in the form of GTA or GRA or a combination for each twelve months students are supported at the same level (step), except in cases where a fellowship or other outside funding is provided, in which case support may be at a different level proscribed by the outside funding entity. Virginia Tech IGEP assistantships have a higher level than other stipends.

2. Time Limits

Time limits of support during study toward the Ph.D. degree will be according to the policies and procedures of the student's home department. For example, in the Department of Biological Sciences support is limited as follows:

Degree prior to enrollment	Degree pursued	Support limits
B.S.	Ph.D.	4(-5) years or 8(-10) semesters
M.S.	Ph.D.	3(-4) years or 6(-8) semesters

Higher numbers in parentheses are applied on recommendation of the student's Advisory Committee due to special, justifiable considerations.

3. Support After the First Two Semesters

Graduate research and teaching assistantships are awarded after the first two semesters in residence at the discretion of the student's major advisor and home department. It is the responsibility of faculty advisors to secure calendar-year support for TPS graduate students starting in the summer of the first year, provided that the student is making satisfactory progress toward their degree.

4. GTA course assignments

When graduate students are assigned support as GTAs, they are expected to devote half-time service (20 h per week for 2-3 laboratory sections) for this support. In lieu of formal teaching assignments, students may fulfill teaching requirements through special outreach activities coordinated by the TPS program, where applicable.

5. Credit Hour Loads

Graduate students must enroll for at least 12 credit hours and must make satisfactory progress toward their degree according to the standards of the TPS program, the participating departments, and the Virginia Tech Graduate School.

F. GRADUATE STUDENT RESPONSIBILITIES

1. Academic Responsibilities

According to the Graduate Policies and Procedures and Course Catalog (p. 16), "the major responsibility for planning and executing the degree requirements rests with the graduate student." While the student should expect good quality advising by his/her Advisory Committee, the TPS Graduate Program, their home department, and the Graduate School, the primary responsibility for knowing the degree requirements and progressing through the degree rests with the student. The student should be familiar with University Policies as detailed in the Graduate Policies and Procedures Manual and with the policies of their home department as detailed in the official documents of that department.

2. GTA Responsibilities

GTA's should give conscientiously prepared, high quality presentations and general assistance to the students in their laboratory courses. Difficulties with teaching should be discussed by the student and teaching supervisor with every effort made to give the GTA positive, constructive guidance. They must post office hours during which they are available to students. GTA's are responsible for meeting all of their scheduled classes and do not have the authority to cancel a class. If extreme circumstances prevent a GTA from meeting his/her class, a substitute should be arranged. In cases of sudden illness when a substitute cannot be scheduled, the teaching laboratory supervisor should be contacted.

3. GRA Responsibilities

In contrast to GTA duties, GRA assignments are generally not limited to 20 hours of service per week, GRA commitments usually also include periods between academic sessions. Part-time employees of the University do not earn any formal leave or holiday time. Consequently, leave for holidays or other appropriate reasons must be discussed in advance with the major advisor.

4. Medical Leave

Graduate students are responsible for informing the TPS Graduate Coordinators in case of a medical emergency or a scheduled medical condition while classes are in session. In the case of planned maternity leave for GTAs and GRAs, the Graduate School has created Work-Life Grants through which departments can request temporary financial assistance equivalent to a stipend for 6 weeks (matching funds from the Graduate School and the College Dean). This request must be submitted by the Department to the Dean of the Graduate School and copied to the College Dean.

5. Honor System

All graduate students should be familiar with the Virginia Tech Honor Code, both for their own information and for the appropriate handling of their GTA and GRA responsibilities.

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