



# Graduate Student Handbook

Department of Plant Pathology, Physiology, and Weed Science

2016-2017

## WELCOME

Welcome to Virginia Tech and the Department of Plant Pathology, Physiology, and Weed Science (PPWS) family. We are delighted that you have chosen to pursue your graduate education in our department and look forward to helping you reach your personal and professional goals. This is the 2016-2017 edition of the **PPWS Graduate Student Handbook**, and is designed to help guide you through the planning and completion of your graduate program. Keep it and refer to it often as it will provide the information and milestone requirements needed to complete your degree.

The PPWS Graduate Student Handbook defines the guidelines and policies governing the Master's and Doctoral Programs offered by the PPWS Department and is supplemented by the information in the current Graduate Catalog and Policies published by the Graduate School of Virginia Tech. Additional information and resources are available on the departmental website, <http://www.ppws.vt.edu/>

I encourage all graduate students and faculty in the department to read this handbook thoroughly. If you have any questions about the material presented in this handbook or suggestions for its improvement, please contact the departmental graduate office (413 Price Hall; 231-0740).

I extend my best wishes to all of you for a successful and rewarding academic year.

**Boris Vinatzer**  
Professor and Interim  
Head  
PPWS Department

*Revised, August 24, 2016*



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## I. DEPARTMENTAL HISTORY

The Department of Plant Pathology, Physiology, and Weed Science (PPWS) is one of the oldest departments of Virginia Tech dating back to 1889. In its early years, the disciplines of the department were housed in the Mycology Department. A separate Department of Plant Pathology was first established in 1907 and continued to exist in various forms until 1935 at which time, Plant Pathology became part of the Biology Department. The current structure of the department was established in 1949 with the name of Plant Pathology and Physiology and remained unchanged until 1983. Weed Science was then added to the departmental name to recognize the three main disciplines housed in the department.

Additional detail at <http://www.ppws.vt.edu/history/>

## II. DEPARTMENTAL MISSIONS AND GOALS

The underlying mission of the department is to optimize plant productivity and quality by limiting the impact of biotic and abiotic stresses on the profitability of crops and other plant enterprises, as well as the impact of these stresses on natural and agricultural ecosystems. The department conducts research, teaching, and extension programs in three distinct plant science disciplines key to productivity, protection, and quality. Disciplines include

- **Plant pathology** – the study of diseases, plant pathogens, and their management;
- **Plant physiology** – the study of plant function, growth and development, and response to environmental stresses;
- **Weed science** – the study of weed biology, ecology, and management.

All major plant commodities grown within the Commonwealth are encompassed within the Department's programs, including row crops, forages, horticultural crops, urban and landscape plants, and forestry.

## III. PERSONNEL

Contact information for current faculty, staff, and students may be found on the departmental website, <http://www.ppws.vt.edu/people/>

### Faculty programs, on campus

Askew, Shawn D.	Turf weeds
Barney, Jacob N.	Invasive plant ecology, biofuel ecology, allelopathy, risk assessment, weed science
Baudoin, Anton B.	General plant pathology, grape diseases, fungicide resistance
Bush, Elizabeth A.	Plant diagnostics, integrated pest management
Collakova, Eva	Regulation of metabolism during seed filling and seed metabolic engineering, folate interconversion and photorespiration
Eisenback, Jon D.	Plant nematology
Flessner, Michael	Weed Extension
Grabau, Elizabeth A.	Department head, molecular biology of soybean improvement, transgenic plants

Greene, Ruth	Air pollution, plant metabolism, plant gene expression and regulation
Haak, David	Plant genomics
Hansen, Mary Ann	Plant disease diagnostics, international plant pathology
Jelesko, John G.	Plant biology, evolution of gene clusters, alkaloid biosynthesis in the Solanaceae
McCall, David S.	Disease management of turfgrasses
McDowell, John M.	Molecular mechanisms of plant disease resistance
Pilot, Guillaume	Regulation of amino acid metabolism and transport
Schmale, David G., III	Plant pathology, food safety and plant biosecurity
Vinatzer, Boris A.	Evolution and function of virulence factors in bacterial plant pathogens
Wang, Xiaofeng	Plant virology
Westwood, James H.	Parasitic weed biology and control

**Faculty stationed at ARECs (Agricultural Research and Extension Centers, off-campus)**

Balota, Maria, Suffolk	Crop stress physiology, photosynthesis, respiration, and growth and development
Cahoon, Charlie	Crop weed extension
Derr, Jeffrey, Virginia Beach	Weed management in nursery crops, landscape maintenance, fruit production, and turf.
Hong, Chuanxue, Virginia Beach	Diseases of ornamentals, phytophthora, environmental plant pathology
Johnson, Charles S., Blackstone	Epidemiology, crop loss assessment, tobacco & small fruit diseases
Langston, David, Suffolk	Diagnosis of diseases and disorders of row crops and vegetables in southeastern Virginia
Mehl, Hillary, Suffolk	Diseases of field crops
Nita, Mizuho, Winchester	Grape disease epidemiology and management
Rideout, Steven, Painter	Vegetable crop diseases
Yoder, Keith S., Winchester	Tree fruit pathology; mode of action and resistance to fungicides

Blackstone, Southern Piedmont AREC (tobacco, small fruits)  
 Suffolk, Tidewater AREC (peanut, cotton, soybean)  
 Virginia Beach, Hampton Roads AREC (turf and ornamentals)  
 Winchester, Alson H. Smith AREC (tree fruits, grapes)  
 Painter, Eastern Shore AREC (vegetables, field crops)

### **Retired but still active**

Griffin, Gary J. Forest pathology  
Hagood, E. Scott Weed control in agronomic crops, low-input sustainable agriculture, integrated weed management  
Phipps, Patrick M. Peanut and soybean diseases, nematology, epidemiology  
Tidewater AREC  
Stromberg, Erik L. Field crop pathology, chemical, biological and cultural disease control  
Tolin, Sue A. Plant virus interaction with host resistance genes, Global IPM for vegetable viruses, Biosecurity and pathogen threat assessment  
Wilson, Henry, Painter Weed management in vegetable and agronomic crops

### **Department Administration**

Boris Vinatzer – ([vinatzer@vt.edu](mailto:vinatzer@vt.edu)) Professor and Interim Department Head  
Anton Baudoin – ([abaudoin@vt.edu](mailto:abaudoin@vt.edu)) Professor and Graduate Program Director  
Guillaume Pilot – ([gpilot@vt.edu](mailto:gpilot@vt.edu)) Associate Professor and TPS Director

### **Department Administrative Support Staff**

**Cris L. Thompson** – ([cris75@vt.edu](mailto:cris75@vt.edu)) Graduate and Communications Coordinator  
Admissions & enrollment, key assignments

**Judy H. Fielder** – ([jfielder@vt.edu](mailto:jfielder@vt.edu)) Program Support Technician  
Travel, reimbursements, departmental vehicle use.

**Patsy J. Neice** – ([pneice@vt.edu](mailto:pneice@vt.edu)) Program Support Technician Senior  
Oversight and reconciliation of departmental funds

**Dana Danis** ([ddanis@vt.edu](mailto:ddanis@vt.edu)) Grants Manager  
Manager for research grants and departmental liaison for Office of Sponsored Programs

**Andrew Mike** – ([amike@vt.edu](mailto:amike@vt.edu)), Network/System Administrator  
Contact for software and hardware support

## **IV. ADMINISTRATION**

The department is administered through a department head, standing committees, a graduate program director, and a staff association officer. In order to ensure a community of inclusivity, most committees include representatives from faculty, staff, and students.

PPWS students participate in the department's Graduate Student Organization (GSO) with its own elected leaders, as well as departmental student representatives to the Graduate School Graduate Student Organization.

## **V. FACILITIES**

### **1. PRICE HALL**

- a. Administrative Offices
  - i. 413 Price Hall: Graduate Student & Communications and Department Head
  - ii. 410: Program Support - Assistant to department head, travel, wage payroll, receiving.
  - iii. 412: Bookkeeping – Grants management, salary payroll, purchasing.
- b. Departmental shared space
  - i. Price 400: Classroom (40 seat cap.)
  - ii. Price 420: Meeting room (25 seat cap.)
  - iii. Price 407: Hatzios library (8 seat cap.)
  - iv. Price 503: Large meeting space (30 – 50 people cap.)

### **2. GLADE ROAD RESEARCH CENTER**

- a. Offices, labs, greenhouses, field plots.

### **3. LATHAM HALL**

- a. PPWS labs and faculty offices on the third, fourth, and fifth floors of Latham.
- b. A classroom and two conference rooms are available.

### **4. OTHER ON-CAMPUS AND NEARBY FACILITIES**

- a. Greenhouse space at the university greenhouses on Washington Street
- b. Field plots at Glade Road Research Center
- c. Field plots at Kentland-Whitethorne Farm, and
- d. Field plots at the Turfgrass Research Center.

## **VI. GENERAL LABORATORY PROCEDURES**

Before a person is permitted use of a laboratory, he/she must first be briefed by the laboratory faculty coordinator or designated representative on the procedures for use of equipment and supplies. The individual may be required to obtain additional specialized training before using facilities (e.g., isotope use).

Authorized laboratory personnel who encounter unidentifiable or unauthorized individuals are expected to report them to the laboratory coordinator or department head immediately.

Authorized laboratory personnel who encounter unidentifiable or unauthorized individuals in a laboratory, their names should be reported to the laboratory coordinator or the department head.

In order to ensure the security and safety of personnel and prevent the loss or theft of equipment, it is required that all unattended laboratories be locked. When leaving a laboratory that will be unattended, even momentarily, it is imperative that the door be locked upon departure.

## **VII. ACADEMIC PROGRAMS**

### **INTRODUCTION**

The Department of Plant Pathology, Physiology, and Weed Science (PPWS) offers graduate programs leading to the M.S. (thesis and non-thesis) and Ph.D. degrees. The M.S. degrees offered by the department are part of the multi-departmental M.S. in Life Sciences program. The department also participates in interdisciplinary graduate programs in Genetics, Molecular and Cell Biology, and Biotechnology (MCBB), and Genetics, Bioinformatics, and Computational Biology (GBCB). Depending upon the degree of preparedness, M.S. programs usually require two years while a Ph.D. program may require four or more years beyond the B. S. degree.

Although PPWS is primarily a department offering graduate degrees, undergraduate service courses are taught for students in other departments within the college and university.

Graduates of our programs are prepared for careers as professional plant pathologists, plant physiologists, weed scientists, or plant biotechnologists. Career opportunities are available in research, teaching, or extension at colleges and universities; in regulatory or research activities with state and federal governments; in administration, sales, research, or product development in agribusiness and agrichemical or biotechnology industry; or in private consulting.

## THE ADMISSION PROCESS

### 1. Regular Graduate Admissions

Admission in the graduate program requires a formal application and \$75 application fee submitted electronically to the Graduate School at <http://graduateschool.vt.edu/admissions/applying/index.html>

Physics, mathematics, botany, microbiology, soils, and genetics at the undergraduate level are required for entry-level graduate students. Qualified students with prerequisite deficiencies may be admitted on a *provisional status* with regular admission granted once deficiencies are satisfied. Such courses will **not** carry graduate credit. Plant science courses beyond introductory botany (e.g., plant anatomy, taxonomy, plant pathology, plant physiology, biochemistry, or molecular biology) are highly desirable.

The initial application review is conducted by the departmental graduate director. At this time, the applicant's area of interest is identified and matched with faculty members whose expertise aligns with the applicant's area of interest. Once selected faculty members have evaluated the application, the Graduate Director submits a recommendation to the department head whether to offer or decline an offer of admission. The department head then communicates the department's recommendation to the Graduate School. Final admission decisions are sent from the Graduate School via email to the applicant.

For full consideration, applicants are encouraged to provide the following:

1. Grade point average (GPA) of 3.0/4.0 or higher
2. Three letters of recommendation
3. Combined verbal and quantitative GRE score of 300 (new scores) or 1000 (old scores)
4. 1-2 page goals statement explaining the motivation and desire for pursuing graduate studies. Deficiencies in any of these areas do not necessarily eliminate a student from consideration. International students are required to take the Test of English as a Foreign Language (TOEFL). Students must score 550 or above on the paper-based test, 213 on the computer-based, or 80 on the internet-based test for consideration.

### 2. Translational Plant Sciences program (TPS)

Students may transfer into PPWS by first participating in the TPS program. The TPS program is a multidisciplinary graduate program comprised of faculty members from throughout the College of Agriculture and Life Sciences and the College of Science who share a common research focus on plant molecular biology.

First-year TPS students complete up to four laboratory rotations in which they participate in varying research activities; learning numerous research techniques, while defining their long term research goals by working side by side with program faculty and students. At the conclusion of the first academic year, students select their permanent graduate program and laboratory for the duration of their studies.

## **NON-DISCRIMINATION STATEMENT**

The Department of Plant Pathology, Physiology, and Weed Science abides by Virginia Tech's **non-discrimination statement**:

Virginia Tech does not discriminate against employees, students, or applicants regardless of race, sex, disability, age, veteran status, national origin, religion, political affiliation, or sexual orientation. The university is subject to Titles VI and VII of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, Sections 503 and 504 of the Rehabilitation Act of 1973, the Americans with Disabilities Act of 1990, the Age Discrimination in Employment Act, the Vietnam Era Veterans' Readjustment Assistance Act of 1974, the Federal Executive Order 11246, Virginia's State Executive Order Number Two, and all other rules and regulations that are applicable. Anyone having questions concerning any of those regulations or accessibility should contact the Equal Opportunity and Affirmative Action Office, 336 Burruss Hall, Blacksburg, Virginia 24061-0216, (540) 231-7500, TTY (540) 231-9460.

## **VIII. CURRICULA**

### **SUMMARY OF DEGREE PROGRAMS**

The department offers programs leading to the Master of Science (M.S.) and the Doctor of Philosophy (Ph.D.) degree. Graduate programs offer training in applied and/or basic plant pathology, weed science, plant physiology, and plant biotechnology through a combination of graduate courses, research programs, and teaching experience. Students are required to complete one semester for the M.S. and two semesters for the Ph.D. of teaching. Teaching assignments are made based upon student input and advisement of the faculty advisor and Graduate Program Director. Research is the most important part of the graduate learning experience. Thus, Ph.D. students are expected to complete no less than 30 credit hours of research.

Each student, upon consultation and approval by their faculty advisor and advisory committee, prepares an individual program of study. Core and supporting courses will vary according to the student's background and area of desired specialization. A current list of recommendations for each "track" within PPWS is posted on the PPWS website.

## **MASTER OF SCIENCE DEGREE**

### **1. Master of Science (M.S.) in Life Sciences**

The Master of Science in Life Sciences merges the efforts of the departments of Biochemistry, Entomology, Food Science and Technology, and Plant Pathology, Plant Physiology, and Weed Science. Students in basic and applied disciplines in the College of Agriculture and Life Sciences share common experiences that prepare them for careers in which interdisciplinary interactions become increasingly valued. At the same time, discipline-specific education and research experience, which characterizes the M.S. in Life Sciences program in each department, prepares students for unique positions and career development. For graduation, students must complete a minimum of 20 graded credit hours and 30 total credit hours.

One feature of this degree program is the completion of a core of three courses, one each in

- Biochemistry (BCHM 5124 - Biochemistry for Life Sciences),
- Statistics (STAT 5605 - Biometry or STAT 5615 - Statistics in Research), and
- Information technology (ALS 5204 – Research and Information Systems in the Life Sciences).

Options to fulfill the remaining requirements for the program of study are listed in the recommendations posted on the PPWS website.

### **2. Non-Thesis M.S. Program**

A non-thesis M.S. Degree in Life Sciences with options in Plant Pathology, Plant Physiology, or Weed Science is available. Students pursuing a non-thesis M.S. in Life Sciences also complete the three core courses listed in the M.S. overview above, and a number of approved electives as well as an internship or equivalent project. For graduation, students must complete a minimum of 24 graded credit hours and 30 total credit hours.

## **DOCTOR OF PHILOSOPHY (Ph.D.) DEGREE**

### **1. Ph.D. in Plant Pathology**

The Ph.D. curriculum requires a strong undergraduate background in basic science, biology, and mathematics. Courses in the biology of plant pathogenic agents, interaction with their hosts, disease control and basic botanical skills are required of doctoral candidates. In addition, the Ph.D. degree requires a firm grounding in the theoretical concepts of plant pathology. A list of course recommendations for a Ph.D. degree in Plant Pathology is posted at [on](#) the PPWS website.

### **a. Core courses for Ph.D. students**

- Plant Pathogenic Agents (PPWS 5054): Covers plant pathogenic prokaryotes, viruses, fungi, and nematodes, their biology, and how they damage plants.

#### **Strongly Recommended**

- Principles of Plant Disease Management (PPWS 5204)
- Diseases of Crop Plants (PPWS 5214)
- Identifying Plant Pathogens (PPWS 6004)
- Clinic and Field Experience (PPWS 5034)

### **b. Conceptual courses for Ph.D. students**

#### **Recommended**

- Plant Disease Epidemiology (PPWS 6004)
- Plant Disease Physiology and Development (PPWS 5454)

## **2. Ph.D. in Weed Science**

Weed science is a well-defined and recognized academic discipline within the general area of plant protection. Although most land-grant universities in the United States offer graduate studies in weed science, in many cases, weed science is not offered as a separate curriculum. As a result, many graduate students specializing in weed science have their degrees awarded in the field of agronomy, botany, horticulture, forestry, or soil science. At Virginia Tech, graduate students specializing in weed science have their degrees awarded in weed science. Core courses in weed science include: Weed Science Principles and Practices (PPWS 4754); Pesticide Usage (PPWS 4264); and Weed Science and Management (PPWS 5704).

## **3. Ph.D. in Plant Physiology**

Minimum requirements for a Ph.D. degree in Plant Physiology are in the recommendations posted on the PPWS website.

## **INTERDEPARTMENTAL CURRICULA**

Several interdepartmental curricula in which PPWS faculty members and students participate have been established in recent years. These curricula serve as vehicles to coordinate and unify course offerings across departmental boundaries. Faculty participating in these curricula retain appointments in their respective departments, conduct advising activities of graduate students, and serve on student advisory committees within the curriculum. Students in these curricula major within any of the participating departments and meet a set of requirements designated by the respective curricula outlined below or in the Graduate Catalog of Virginia Tech.

**1. Genetics, Bioinformatics, and Computational Biology (GBCB)**

Students in this program receive their degree in GBCB. The program combines quantitative methods from computer science, mathematics, and statistics and applies them to the area of life sciences. Further information can be found by visiting the program's website: <https://gcb.vbi.vt.edu/gcb/>.

**2. Molecular Cell Biology and Biotechnology (MCBB)**

A multi-departmental collaborative program, students obtain their degree in their home department, but fulfill MCBB requirements by completing a common set of courses:

1. Molecular Biology of the Cell (BCHM 5214)
2. Molecular Biology for the Life Sciences (ALS/PPWS 5344)
3. Seminar in Molecular Cell Biology and Biotechnology (PPWS 5064)
4. Topics in Molecular Cell Biology and Biotechnology (ALS/PPWS/BIOL 6024)

## **IX. IMPORTANT ACADEMIC POLICY STATEMENTS**

### **GRADUATE STUDENT ADVISORY COMMITTEE**

Committees for M.S. students are comprised of **at least** three members and **at least** four members for Ph.D. students. The graduate student, in consultation with his or her advisor, nominates the faculty who will serve on the advisory committee. The committee aids the student in planning a program of study, determines research direction, and administers the preliminary and final examinations.

Faculty who serve on advisory committees are expected to have scientific expertise that will help the student complete his or her degree requirements. They are also expected to participate in one or more meetings each year, and respond in a positive manner to the student's request for assistance on his or her research. The committee member is expected to read and evaluate a student's program of study, thesis or dissertation outline, and annual progress reports. Evaluation of the service and contributions of advisory committee members is made on an on-going basis by the student's advisor in his letter to the department head and on the student's Annual Progress Report, which is reviewed and approved by each advisory committee member.

During the final exit interview between the student and the Department Head, the service and contributions of the advisor and the advisory committee members will be fully evaluated. Additionally, the student is encouraged to meet with his or her Advisor and/or department head concerning advisory committee member performance. The student may consult the department head or graduate director if there are concerns about his or her advisor.

A student's committee must meet **at least** once a year, and review the **Student Annual Progress Report**. The advisor provides a **letter** concerning the discussions and actions taken at the meeting, and the student posts both his/her annual report and the advisor's letter to the student's ePortfolio matrix. Each committee member is then asked to complete

a very brief ePortfolio questionnaire about the student's progress. Students are strongly encouraged to familiarize themselves with the Graduate School's policies on programs of study, committee structure, theses and dissertation submission requirements, as well as other timely information of value to one's academic training. The Graduate School publishes the online **Policies** section of the **Graduate Catalog** ([http://graduateschool.vt.edu/graduate\\_catalog/policies.htm?viewAll=true](http://graduateschool.vt.edu/graduate_catalog/policies.htm?viewAll=true)) that contains important information relative to programs of study, committee structure, theses and dissertation preparation and other information of value to your academic training

## **PLAN OF STUDY**

Upon consultation and approval of one's major advisor and advisory committee, each student plans an individual program of study. Core and supporting courses will vary according to the student's background and area of desired specialization. A list of course requirements and recommendations can be viewed on the PPWS website. Once completed and committee signatures are obtained, students must submit the plan of study to the departmental graduate program coordinator for submission and approvals by the PPWS Department Head and Graduate School.

Students entering Fall Semester are expected to submit a plan of study by no later than February 1, or before the completion of 15 credit hours. For students entering Spring Semester, the deadline is December 1.

## **ANNUAL PROGRESS EVALUATION**

The department and the Graduate School require that each graduate student receive an annual progress evaluation from their advisory committee. The purpose of the annual review is to ensure that the student is making sufficient progress toward fulfillment of degree requirements. The information provided in the review form is also beneficial in selecting students for fellowships, tuition waivers, and awards. Letters of recommendation and news releases are also written from such information.

Progress evaluation results by advisory committee members may be completed online utilizing the student's Scholar ePortfolio (will change). Evaluations may also be alternatively submitted by downloading a printable copy from the departmental website. Each committee member and committee chair should submit the evaluation either electronically via ePortfolio or manually to the graduate director or graduate coordinator by December 1 (for returning students) or February 1 (first-year students).

Student compliance in completing the evaluation on time ensures satisfactory progress is being made toward one's degree and provides students with the necessary feedback to address deficiencies that may delay degree completion. Students are expected to complete and upload self-evaluations to ePortfolio by December 1<sup>st</sup>. Failure to submit evaluations by deadline(s) outlined here may result in academic suspension and/or the suspension of

financial assistance until the requirement is met. If students are unable to meet the evaluation deadline, students are strongly urged to contact the Graduate Program Director regarding the evaluation status.

\*Student ePortfolio's may be found in the folder *PPWS Student Progress* on Scholar (scholar.vt.edu). Students or faculty unable to access Scholar's ePortfolio or in need of assistance should contact the Graduate Program Director or Coordinator for guidance.

## **THESIS/DISSERTATION RESEARCH PROPOSAL**

All graduate students in the Department of Plant Pathology, Physiology and Weed Science enrolled in the thesis or dissertation research options, are **required** to post a copy of thesis or dissertation proposal to their ePortfolio matrix **before** the end of the third semester of matriculation. The proposal shall contain:

1. **A Research Proposal Title Page** (Formatting recommendations may be found on the departmental website)
2. **Research question(s) and/or objective (hypothesis):** Brief outline of research questions to be addressed and/or the objectives (hypotheses) to be determined or tested.
3. **Justification:** Provide enough justification in the form of a literature review, etc. to lead to the research question(s) and/or the objective or hypothesis to be tested.
4. **Procedures:** Present sufficient procedural information to insure that a professional scientist in the area of research will be able to understand the procedures; indicate the research methods to be employed, the statistical methods to be utilized, and any other information which will help in the evaluation of the procedures.
5. **Facilities and equipment** required.
6. **Literature cited:** List all literature; include a complete literature citation.
7. **Timetable:** Sequence of experiments and estimate of time required for completion.

The exact length, format, and depth of the thesis or dissertation research proposal are dependent upon the needs of the graduate student and the student's committee. Sufficient information should be presented in the proposal to warrant the approval of all committee members as well as the department head.

Students are strongly urged to prepare their thesis/dissertation research proposal in a form appropriate for submission to a granting agency such as NSF, NIH, USDA competitive research grants program and Virginia Agricultural Foundation.

## STUDENT SEMINAR POLICY

The Department of Plant Pathology, Physiology, and Weed Science sponsors a weekly Departmental Seminar Series as a regularly scheduled graduate class in the fall. All students are **required** to participate in this course. In addition, there are other seminar series and special seminars supported by the departmental faculty and students. They provide an avenue for bringing the latest techniques and philosophy of science to the group. Student participation encourages development of professional skills in communication and is viewed as an opportunity to explore in depth, specific areas in scientific literature. Faculty and students are placed in a situation of constructive interaction at these presentations.

The following comments are intended to set **minimum** student requirements as well as other information regarding the administration of the departmental series and the coordination of other seminars.

1. M.S. students will present **one seminar for credit and one terminal or leaving seminar**; Ph.D. students will present **two seminars for credit and one terminal seminar**. Students with prior M.S. degrees may transfer seminar credits if desired; however, they will not be credited toward the required seminars of their Ph.D. program.
2. Seminar sign-up will be held each spring for the following academic year. **Seminars for credit should be included in the student's plan of study**; flexibility must be allowed as to actual dates involved.
3. Seminars will be offered on a grade (A-F) basis. For seminars given in other series (see item 5), the grading policy of the series will be accepted. Grading, approval of seminar titles, and administration of individual seminar classes will be the responsibility of the seminar instructor.
4. A student must present at least one seminar on their research (a research proposal or a research update), and the other seminar may be on their research or a literature review. A research proposal seminar may be presented as a student's first seminar, not later than the **third** semester in residence. This seminar includes an in-depth literature review, statement of objectives, justification, proposed experimental plan, results (if available), and a discussion of the results. Seminars should clearly describe the impact of the work on society/agriculture/environment. **An abstract must be provided to the departmental seminar instructor five days prior to the oral presentation.**

A literature review seminar is designed to encourage students to explore areas **distinctly different** from their planned programs; this seminar should be on a topic or subject that does not involve research in the immediate area of the speaker's thesis or dissertation research. It should reflect an in-depth treatment of the subject matter and the topic should be developed in consultation with the advisor and/or other PPWS faculty.

5. Ph.D. students are permitted to give one required seminar in an interdepartmental seminar series, provided that PPWS requirements (advance notification, abstract distribution, evaluation, etc.) are fulfilled. M.S. students will present all required seminars in the PPWS series, but may elect to give additional seminars in other series.
6. The departmental seminar instructor, who is appointed by the department head, coordinates all seminars. The coordinator arranges the seminar schedule and keeps record of all seminars given, including all abstracts. In consultation with the Education Committee or a designated Seminar Committee, the seminar coordinator will review and develop policy for administration of the program for consideration by the departmental faculty.
7. Non-credit seminars (student terminal seminars, visiting faculty, resident faculty, and postdoctoral seminars) will be coordinated through the department head.

All M.S. (thesis and non-thesis) and Ph.D. students are required to present a seminar on their project or research as a requirement for graduation. This seminar will be considered part of the final thesis or dissertation examination, and should be presented **no more than two weeks prior** to the examination or defense date. **No graduate program will be sent to the Graduate School as complete without a terminal seminar and examination.** The date and time of the examination (open seminar and defense to advisory committee) must be publicized in a way that affords all interested faculty the opportunity to attend the examination. Unless prior approval is received from the department head, it is expected that all dissertation defenses are scheduled and presented at the Blacksburg campus. As with other seminars, an **abstract must be distributed five days prior to the oral presentation.**

If a final seminar will be presented within the same semester as a department seminar, a seminar in the style of an oral presentation at a scientific meeting can be substituted for a literature review of research update seminar. One succinct complete aspect of your research that would be suitable for an oral presentation at a scientific meeting will follow strict time limitations of 15 minutes for the presentation with a two-minute warning followed by 5 minutes for questions.

## **TEACHING/COMMUNICATION REQUIREMENT**

Communication skills are an important asset to all professionals in the fields of plant pathology, plant physiology, and weed science as well as teaching and extension professionals. Students in PPWS can develop their oral communication skills by the presentation of seminars and research papers; however, exposure to other aspects of communication is also needed. The primary objective of the teaching/communication requirement is to provide students with meaningful teaching/communication experiences to enhance their ability to compete in the job market. Another important objective is to meet the teaching needs of the Department.

All students in the Department of Plant Pathology, Physiology, and Weed Science are required to participate in an approved teaching/communications experience. M.S. students are required to complete one teaching/communication experience, and Ph.D. students are required to complete two teaching/communication experiences. Students are also encouraged to take courses formal courses on pedagogy and participate in a GTA workshop offered through the graduate school (offered annually; GRAD 5004).

M.S. students must engage in at least 100 hours of teaching/communication experience(s) throughout a semester to complete their teaching requirement. This may be fulfilled by serving as a formal TA associated with a course (assigned by the Graduate Program Director) or may include an alternative experience (see below).

For a Ph.D. student, the student must engage in two independent teaching/communication experiences to complete their teaching requirement. At least one of the teaching experiences must include serving as formal TA associated with a course (assigned by the Graduate Program Director) and represent at least 100 hours of teaching experience(s) throughout a semester. The second teaching requirement may consist of an alternative experience, and this experience is expected to be at least 50 hours of teaching/communication experience(s).

In a formal TA experience for a PPWS course, this time may be spent in the classroom to perform duties and/or observe specific teaching approaches such as listening to lectures, holding office hours with students, teaching lectures or labs (within PPWS, or outside of the department and associated with appropriate funds for the position from the respective department), conducting review sessions, and/or grading exams and quizzes. In an alternative experience, such as the delivery of a series of lectures for a course, this time may be spent on research for the lectures, lecture preparation, lecture practice, and lecture delivery.

Alternative experiences may include, but are not limited to:

- Design laboratory experiments
- Design and development of pedagogical materials such as slide sets, audiovisual packages, etc. for classroom use or use outside the classroom (e.g. extension agent education)
- Leading professional development workshops for peers (e.g. instructing fellow students in particular skills such as photographic techniques)
- Delivery of a series of lectures for a course
- Develop and deliver extension presentations
- Engage in an outreach/educational program beyond the confines of the University (e.g., participation in the high school PREP program)
- Engage growers in practical plant health solutions

In the spring of each year, the Graduate Director and/or Education Committee will survey faculty with respect to teaching needs, and students with respect to course and assignment preference as well as scheduling preferences for the following academic year. Where appropriate, students should consult with their advisors, their advisory committee, and with

the course instructor involved. Based on this survey, with its input from the student and their advisor and advisory committee, as well as course instructors, assignments will be made by the Graduate Director in consultation with and final approval by the Department Head before the start of the Fall Semester. Two or more students can share teaching assignments that are particularly demanding. New students are generally not required to teach during the first semester of their program; however, they may elect to volunteer. All students are assigned to a faculty member. This faculty member will work with the student to ensure that he/she learns the various aspects of the teaching process. In order to provide constructive criticism, the faculty member must observe the student's teaching ability in the classroom. Upon completion of the assignment, the faculty member will write a brief evaluation for the student's file.

## **COURSE AND INSTRUCTOR EVALUATION PROCEDURES**

Student evaluation of instruction is an important tool for assessing and improving teaching. Students who are Teaching Assistants (TA's) are evaluated using the same College questionnaire as the faculty. TA's will benefit from this by identifying areas for improvement and have a solid record of teaching skills. Faculty members responsible for courses in which TA's participate will also evaluate the performance of the TA.

## **GRADUATE STUDENT EXAMINATION PROCEDURES**

Students may need an informal qualifying exam to determine their course needs and level of attainment. The traditional preliminary exam should be given after most VT courses have been completed and for admitting the student to candidacy.

All M.S. students majoring in Plant Pathology, Plant Physiology, Weed Science are required to take a **final oral exam** administered by their committee at the completion of the Thesis, Project and Report, or Internship. The exam is usually administered during a half-day session and covers all aspects of the student's academic training including course work and defense of the thesis or Project and Report (**see Policies and Procedures Section in the Graduate Catalog**). In addition, students will present a **final seminar** (see attachment for the Student Seminar Policy, page 16 of this handbook).

Ph.D. students are required to take an oral and written **preliminary exam** at least 6 months prior to graduation (see Graduate Policies). This examination focuses on the student's academic preparation. The written portion of the exam is administered prior to the oral portion. The oral portion of the exam is usually administered during a four-hour session. Students are required to take a final **Oral Exam** and **present a defense seminar** (see attachment for the Student Seminar Policy, page 16 of this handbook).

### **I. THESIS AND DISSERTATION**

The Master's thesis is a written report resulting from a research project conducted under the guidance of a faculty advisor. The thesis option for a M.S. degree provides more opportunity for in-depth work in a specific topic or application than would be possible under the non-thesis option. The final examination includes a presentation of the thesis and thesis defense in response to questions from the advisory committee.

The centerpiece of the Ph.D. degree is the dissertation. Under the guidance of a faculty advisor and an advisory committee, the doctoral candidate engages in a major research project. The dissertation is the written document, following professional standards, resulting from the research project. Through his/her dissertation work, the doctoral student moves beyond the relatively passive role of receiving knowledge presented in courses to become an active, self-motivated scholar, making a significant contribution to their area of specialty. The work of the dissertation is expected to be of such quality as to merit

publication in a scholarly journal, after appropriate revisions. For those continuing in academic research, the dissertation topic may initiate a more lengthy research program that forms the beginning of a scholarly career. For those who continue in a nonacademic direction, the dissertation experience is valued because it requires the highest level of creativity and independent thinking. When the dissertation research and writing are completed, a doctoral candidate must defend his research at a final oral examination known as the dissertation defense. The final examination is open to the entire faculty of the university, and questions may be asked that do not pertain directly to the dissertation being defended.

Virginia Tech requires graduate students to submit their thesis or dissertation electronically. For instruction, see <http://etd.vt.edu> and for other **graduation requirements and timelines** [http://graduateschool.vt.edu/academics/commencement\\_deadlines](http://graduateschool.vt.edu/academics/commencement_deadlines)

#### **J. EXIT INTERVIEW**

To help the department continue to strengthen its programs, each graduate student is asked to complete an exit interview with the department head. The exit interview is held in an informal conversational atmosphere and provides the student a reflective opportunity to share feedback on positive areas of their academic experiences as well as potential growth opportunities in which the department could better serve its students.

#### **K. CALS GRADUATE PROGRAM STANDARDS**

The College of Agriculture and Life Sciences has formulated Graduate Program Standards, a set of responsibilities of departments, graduate, advisors, and students. These are posted at <http://www.ppws.vt.edu> .

## **X. ADDITIONAL INFORMATION AND POLICIES**

### **A. PPWS GRADUATE STUDENT ORGANIZATION**

The Graduate Student Organization (GSO) for the Department of Plant Pathology, Physiology and Weed Science is a service organization whose function is to help the graduate student with his/her educational needs. The objectives of this organization are: 1) Development of programs to assist graduate students; 2) Facilitation of communication between graduate students and the Department Head and faculty, and amongst themselves 3) Foster professional and social development of the graduate student; and 4) aiding in the selection of graduate students for participation in departmental and University activities.

#### **1. Membership**

All graduate students of the Plant Pathology, Physiology, and Weed Science Department are members of the organization.

#### **2. Meetings**

General meetings of the GSO are held each semester and as necessary.

All meetings are open to the faculty.

Meeting announcements are made to all graduate students and faculty.

Decisions are made by majority vote of graduate students present at a general meeting, or by a majority vote of graduate students conducted through a paper (or email) ballot distributed to all graduate students.

#### **3. Officers**

Officers are elected each spring at the general student meeting. Officers are listed on the PPWS website.

#### **4. Delegates to Virginia Tech Graduate Student Assembly (GSA)**

The Department Head nominates students to represent PPWS to the university GSA. Representatives serve as a liaison between the university and department organizations.

### **B. DEPARTMENTAL KEYS**

Each student will be issued keys to areas where continuous access is needed as authorized by the department. Keys for labs and/or offices in Price Hall and the Glade Road Research Center (PMB Building) are issued to students by the Graduate Coordinator. Keys for Latham Hall are controlled by individual faculty housed in that building. **Keys are issued to individuals for their exclusive use only, and must NOT be shared with others.** As

property of the State of Virginia, keys cannot be duplicated.

At the completion of studies at Virginia Tech or upon request, **all keys must be promptly returned to the graduate coordinator.** A strict accounting of the keys issued to each student is maintained; loss of any key should be reported immediately to the graduate coordinator in 413 Price Hall. Failure to present or return keys up on request may result in an academic hold placed on the student's account preventing access to class schedules and transcripts.

#### **C. PRICE 5<sup>TH</sup> FLOOR SEMINAR ROOM USE (503 Price Hall)**

Students are welcome to utilize the Price 5<sup>th</sup> floor seminar room for formal presentations or informal discussions. The room may be reserved by contacting the Graduate Coordinator. **By using the space, students agree to properly dispose of food items and trash, and return the space to its original condition for future use of others.**

#### **D. VEHICLE USE POLICY**

Qualified drivers must carry a valid license within their state of residency before using any State owned university vehicle. Drivers must also be regular salaried employees. Eligible students must hold a graduate assistantship and have a signed FS-2 form on file within the department and renewed annually. Students should contact Judy Fielder ([jfielder@vt.edu](mailto:jfielder@vt.edu)) to request a copy of the form.

#### **E. USE OF DEPARTMENTAL COPY MACHINES**

Photocopying for research purposes (**not** course homework or personal use) is permissible on department machines via a passcode provided by the student's advisor.

#### **F. SUPPLIES AND AUDIOVISUAL EQUIPMENT**

Office supplies are not provided to students, even if employed by the department. Research supplies must be obtained through the research project director, i.e. field notebooks, data pads, etc.

Audiovisual equipment is available for short-term use to PPWS students and may be checked out in 413 Price Hall during regular business hours. Individuals borrowing the audiovisual equipment are directly responsible for all components and accessories associated with the equipment, as well as the loss or negligent damage to such. Students are also expected to promptly report any malfunction equipment to the graduate coordinator.

## **G. USE OF TELEPHONES AND FAX MACHINES**

Departmental lab telephones where available, **DO NOT** provide access to long distance lines, and are for business and professional use only. Long distance business calls should be arranged through your major advisor; personal calls should be limited. Unauthorized personal and/or long distance calls on any university telephone are prohibited.

Fax machines are available at Price Hall, Latham Hall, and Glade Road Research Center. Students are allowed to receive fax messages at these machines. To send business fax messages through our departmental fax machines, students must arrange to have access through the appropriate clerical staff or your major advisor.

## **H. DEPARTMENTAL BOOK COLLECTIONS**

The Hatzios Library located in 407 Price Hall contains an extensive collection of books and periodicals on weed science. You may obtain access to the room by contacting the Graduate Coordinator in 413 Price Hall.

An older collection of books is maintained in room 503 Price Hall. Books may be checked out for use by PPWS faculty, staff, and students. These materials may be accessed by other members of the Virginia Tech community but cannot be removed. Theses, dissertations, and special collections are secured in a locked area of the library. Access to these items can be obtained from the Graduate Coordinator.

## **I. PARTICIPATION IN SCIENTIFIC CONFERENCES**

Professional scientific meetings are of considerable value to graduate training. Students are encouraged to attend and present papers or posters at scientific meetings. Professional societies include the Virginia Academy of Science, the American Phytopathological Society (APS), the American Society of Plant Biologists (ASPB), the Weed Science Society of America (WSSA), and their corresponding regional chapters. In order to offset the costs of attendance, financial assistance may be available within the university community to students presenting papers or posters at these meetings. The Graduate Student Assembly (GSA) of Virginia Tech provides travel grants to eligible graduate students for participating at scientific conferences. Detailed information may be found on the Graduate Schools website <http://graduateschool.vt.edu>.

## **J. UNIVERSITY COMPUTER USE POLICY**

The department follows and supports [Policy 7000: Acceptable Use and Administration of Computer and Communication Systems](#) as set forth by the university. Policy details may be found at <http://www.vt.edu/about/acceptable-use.html>.