Cornell University

Field of Soil and Crop Sciences

Graduate Study Handbook

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Please use this *Graduate Study Handbook* as a tool to guide you through your program, but note that University, Graduate School, College, and Section policies and procedures are subject to change. Be sure to confirm your plans with your Special Committee, the Director of Graduate Studies (DGS), or the Graduate Field Assistant (GFA).

Field of Soil and Crop Sciences – Graduate Study Handbook

Welcome to the graduate Feld of Soil and Crop Sciences (SCS), an administrative unit of the Cornell Graduate School. We are closely affiliated with the Section of Soil and Crop Sciences, an administrative unit that handles fiscal and general personnel issues that is analogous to an academic Department. The organizational structure of fiscal/academic units at Cornell, from largest to smallest, is:

* Cornell University
* College of Agriculture and Life Sciences (CALS)
* School of Integrative Plant Science (SIPS)
* Section of Soil and Crop Sciences

The organizational structure of graduate fields is:

* Cornell University
* Cornell Graduate School
* Field of Soil and Crop Sciences

SIPS was first established in 2014 with the hope of fostering cross disciplinary collaboration among its various sections, which include, Plant Biology, Horticulture, Plant Pathology and Plant-Microbe Biology, Plant Breeding and Genetics, and Soil and Crop Sciences.
The field offers qualified students the opportunity to obtain an advanced graduate degree in a Master of Science (M.S.) degree program, the Masters of Science/Doctor of Philosophy (MS/Ph.D) and a Doctor of Philosophy (Ph.D.) degree program.

The Graduate School at Cornell is organized by “fields” rather than sections/departments, so the Section of Soil and Crop Sciences covers the field of Soil and Crop Sciences. Some faculty in other plant science related departments are also graduate faculty members of the field of Soil and Crop Sciences. Although this may seem to be an unusual organizational structure, it allows faculty with similar interests in different departments to sponsor graduate students.

Upon Arrival

Newly admitted graduate students should correspond with the director of graduate studies in their field to clarify program details. Upon arrival to campus, students should report to their major advisor, the director of graduate studies, and the graduate field assistant. New graduate students should take the responsibility of meeting professors, other graduate students, office staff, technicians, greenhouse, and field staff. Students should also become familiar with campus buildings, laboratories, and staff offices. The director of graduate studies, as well as other faculty members and staff, can provide assistance to become familiar with university and Section policies. An orientation program for all incoming graduate students is held during the week of registration in January and August.
This handbook will help you understand how the section operates, what is expected of you, and what you may expect from the section. The faculty, director of graduate studies, and the Section chair have an open-door policy and make every effort to address student needs. This handbook provides supplemental information that applies specifically to the field of Soil and Crop Sciences and should be used in conjunction with information published by the Graduate School (www.gradschool.cornell.edu). Please feel free to ask questions as you adjust to your new surroundings.

Major Advisor & Special Committee

The faculty person who directs your thesis work is usually considered the major advisor/chairperson of your special committee. This advisor is most often identified prior to your arrival and will guide you through your graduate study. Your chair should be recorded with the Graduate School within the first 3-weeks of admission. Use the Special Committee Selection and Change form to assign your chairperson. This can be done on-line at www.gradschool.cornell.edu/forms or directly through 'Student Center' website.

Other members of the special committee represent the minor fields chosen (one additional faculty member/field for a M.S. degree and two additional faculty members/fields for a Ph.D.), plus any additional members that you may wish to add.

Major professors are responsible for graduate students' academic programs. Most students will know which faculty members will serve as their major professors before they begin their graduate work. Selecting a major advisor represents a commitment on the part of the graduate student and the faculty member to working together intensively for a number of years. The faculty member should share with the new graduate student their perspective and expectations. Graduate students are encouraged to meet with current members of the faculty member's program and discuss the realities of working with the faculty member. Do not ignore the role of personalities in the working relationship between faculty and student. Working with someone who you get along with can have major benefits, and trying to work with someone who you do not get along with can produce major problems.

The Cornell University board of trustees awards degrees, acting on the recommendations of the graduate faculty, which, in turn, acts on the recommendations it receives from the special committees. These special committees, which are unique in composition for each graduate student, supervise and evaluate the performance of students during the graduate program. Each special committee is chaired by a major professor, who is a member of the Field of Soil and Crop Sciences, and also is affiliated with the Major Concentration chosen by the student. Each committee has at least one additional (minor) member if it is supervising a student accepted for an M.S. program. Special committees supervising students accepted for a Ph.D. program have at least two additional (minor) members, with at least one representing a concentration outside of Soil and Crop Sciences. The special committees determine coursework programs for students, evaluate progress by recommending a suitable number of residence credits at the end of each semester, and conduct examinations required by the graduate faculty. Students are free to select members of their special committees. For students accepted by the Field of Soil and Crop Sciences, each committee can include only one voting member from any single area of concentration. Students can, however, include additional nonvoting members on their committees if they wish. The graduate faculty has delegated to the Fields the authority to establish general coursework requirements and criteria for evaluating performance in courses. The Field of Soil and Crop Sciences, which does not have coursework requirements, usually defers to the judgment of students' special committees regarding this matter. An exception is the M.P.S. degree, which has specific requirements. Evaluation of overall performance and progress of students is determined annually by the Field. At the end of each semester, chairs of special committees evaluate academic performance and/or progress on thesis research and report to the graduate faculty. Each student's performance is reported either as satisfactory, with the recommendation that the maximum appropriate residence credit be awarded; as partially satisfactory, with recommendation that less than the maximum residence credit be awarded; or as unsatisfactory, with the recommendation that no residence credit be awarded. These recommendations take into account reports that other members of the special committees forward to the chairs. The graduate faculty requires students to pass certain examinations conducted by the special committee. Ph.D. students are required to take an admission to candidacy exam ("A" exam) and a defense of thesis dissertation exam ("B" exam). The "A" exam is open to all Field faculty who desire to participate. The Field of Soil and Crop Sciences may establish its own policies with respect to examinations or defer to the judgment of the

special committee, whose members may require that at least part of the examination be written. (Most examinations are entirely oral.) It is seldom appropriate to change the chair of the special committee. Sometimes a change may be necessary; the chair may go on sabbatical leave at a crucial time or leave the university entirely. Occasionally, the student's evolving interests converge with those of another professor, and everyone concerned may agree that a change is appropriate. Approval of the change may depend on whether funds are available to provide support for the student after the change is made. This decision necessarily involves the Director of Graduate Studies, the present chair, the proposed chair, and the department chair if a change in funding source is involved. Students should not seek a change simply because they believe another professor would have different expectations with respect to coursework or research requirements.

The major professor (chair), the Director of Graduate Studies, or the Graduate Field Assistant will be able to answer questions and discuss special circumstances regarding the special committee, the chair of the special committee, and residence requirements.

Field Appointed Committee Member

The Director of Graduate Studies may assign an additional member of the Field of Soil and Crop Sciences to participate in your A/B exams and/or final exam. This person would be recorded on your Special Committee as: Field Appointment Member for Exam.

Responsibilities of Major Professors and Sponsors

Major professors (or supervisors) have the following obligations to graduate students:

Have a general knowledge of the student's ability to handle personal financial affairs.

Make arrangements for office space and facilities for the student.

Consult with the student regarding a special committee and see that the student proposes names to the Director of Graduate Studies and the Graduate School for approval.

Ensure that the special committee has approved the course of study by the end of the first semester of residence.

Ensure that the special committee has approved the thesis research proposal for an M.S. degree by the end of the second semester and the dissertation proposal for a Ph.D. degree by the end of the second semester of residence.

Approve the student's annual report before it is submitted to the Field.

Approve the thesis draft before it is presented to other committee members.

Involve the special committee in the early stages of the student's proposed course of study and research project.

Assume major responsibility for the intellectual, scientific, and technical guidance of the student.

Responsibilities of the Graduate Student

All graduate students are provided with field, laboratory and/or greenhouse space and materials to accomplish the research required for their degrees. Depending on their funding source, students may be expected to participate in other projects their major professors consider appropriate, even though projects may not be directly related to their own degree programs or research. Participation in such projects should enhance each student's graduate training, but it will not be so extensive and demanding that it prolongs the graduate program beyond the time normally required for completion of M.S. and Ph.D. degrees.

Students are responsible for initiating discussions with major professors concerning thesis research, coursework, and special committee appointments and meetings. They should also let their major professors know about any financial or personal problems that threaten their progress toward the completion of degree requirements. This kind of communication enables the major professors and the Field, through the Director of Graduate Studies, to be of maximum assistance in ensuring that each student's experience at Cornell is intellectually rewarding and personally satisfying.

In-House Application to a Ph.D. Program

Students who were admitted into the M.S. degree program, have fulfilled those requirements, and then wish to continue their studies in a Ph.D. program must complete a new on-line application for admission to the Soil and Crop Sciences PhD program. Application fee waiver information can be found here: http://www.gradschool.cornell.edu/admissions/fees.

Note: The *Application for Readmission* (Form R3) is only used for students who have let their registration lapse in their current program and wish to return to finish their degree: http://www.gradschool.cornell.edu/sites/default/files/field_file/gradform_r3.pdf.

Registration Units

A registration unit (RU) represents the satisfactory completion of one academic semester of full-time study or research. Registration units measure student progress by the length of time spent in pursuit of the degree.

Graduate School degrees require a certain number of registration units.

- For the research master's degree, two registration units are the minimum requirement. Exception: One registration unit is the exception for the M.Eng. degree.
- For doctoral candidates, a minimum of six registration units is required with at least two coming after the A Exam. (See "Examinations")
- Special or terminal master's degree programs (See "Exams required for the Ph.D.") require at least four registration units.

For all research degrees, at least half of the registration units must be earned from full-time academic-year study on the Ithaca campus or satellite locations. (Part-time students are exempt from this requirement.)

M.P.S. degree programs do not require registration units.

Degree Requirements

M.S. Degree Requirements

- Coursework and credits required for the M.S. degree are determined by the student's Special Committee.
- Candidates must maintain a 3.0 grade point average.
- Attend at the PLSCS 6970: *Seminar in Soil and Crop Sciences*. The seminar requirement is firm and must be met by all students. Satisfactory seminar attendance involves attending at least seven presentations each semester.
- Register for PLSCS 8900 (*Master's Level Thesis Research*) after the first semester of study. Credit hours may vary and should be discussed with your chair.

- Student selects a Special Committee composed of one professor representing the major field/chair and at least one professor representing a minor field; more than one minor member is acceptable.
- Committee members advise students in the selection and conduct of research problems for the thesis.
- You must submit a complete thesis draft to all members of your Special Committee at least six (6) weeks before the final Master's exam. (Your Special Committee may modify this requirement.) At least five (5) days before the exam, you must provide all members of your Special Committee with a complete, formatted, and editorially acceptable copy of the thesis or dissertation for final approval. (Your examining committee may still require modifications.) **Final Examinations may <u>not</u> be scheduled until this requirement has been met.** Code VI.G.4, *Guide to Graduate Study.* **You must submit a Schedule of Masters Exam form to the Graduate School at least seven days prior to your oral exam. The form can be found on the Graduate School website.**
- The field requires that each M.S. and M.P.S. (Agriculture and Life Sciences) student present a half-hour seminar presentation on their research prior to degree completion. Exit seminar must be scheduled during one of the PLSCS 6970: *Seminar in Soil and Crop Sciences.*
- Pass a final oral examination.
- Fulfill a minimum of 2 registration units for at least two semesters (*Code of Legislation, V.C.)*.
- Students in a Master of Science degree program are expected, but not required, to obtain teaching experience, which can be satisfied by assisting a faculty member in teaching a course, working in extension, or taking a course in education.
- Candidates must submit an acceptable thesis based on a research project.
- M.S. degree candidates are expected to complete degree requirements within two years but, have up to 4 years to complete requirements.

PhD or MS/PhD Degree Requirements

- Students who desire a Ph.D., may enroll in a M.S./Ph.D. program or be directly admitted into a PhD program. Our M.S./Ph.D. students will be expected to take a master's exam and submit a thesis. Once the thesis has been submitted and approved, the student can continue on in the Ph.D. program. To complete the Ph.D. program, students must pass an admission to Ph.D. candidacy oral exam (A exam), conduct research, write and submit a dissertation, and then defend the thesis in an oral exam (B exam). The Master's and A exam can be combined; but a thesis will be required.
- Candidates must maintain a 3.0 grade point average. Course guidelines have been developed to promote a minimum level of knowledge and experience in the major field and concentration (see Course Guidelines). Students are expected to adhere to these guidelines except under extenuating circumstances, in agreement with the special committee and the graduate field. Any course grade of C+ or lower, a grade of "incomplete", or an overall GPA below 3.0, does not constitute satisfactory course performance. Students whose overall GPA drops below 3.0 are considered to be "on probation" and will receive a notice from the Director of Graduate Studies (DGS). Research credits are assigned S/U grades only, and are excluded from the overall GPA. A student on probation has one semester to improve his or her course performance, or the field may elect to discontinue the student's field membership. Extenuating circumstances will be discussed in the annual review meeting (see below). The above

criteria are minimum performance criteria, and do not exclude special committees from setting more stringent criteria for individual students.

- Student selects a Special Committee composed of one professor representing the major field/chair and at least two (2) other professors as minor members, representing fields other than Soil and Crop Sciences. This approach permits the student to work with faculty members who can best direct the student's graduate study, regardless of college, Section, or field affiliation.
- Coursework and credits required for the Ph.D. degree are determined by the student's Special Committee.
- Attend the PLSCS 6970: *Seminar in Soil and Crop Sciences*. The seminar requirement is firm and must be met by all students. Satisfactory seminar attendance involves attending at least seven presentations each semester.
- Register for Ph,D, thesis/research credit each semester: PLSCS 8900 (Graduate Individual Study in Soil and Crop Sciences, prior to successfully passing A Exam.) PLSCS 9900 (Doctoral-Level Dissertation Research, after passing A Exam) Credit hours may vary and should be discussed with your chair.
- Committee members advise the student in the selection and conduct of research problems for the dissertation.
- Candidates must submit an acceptable dissertation based on a research project.
- Pass the "A" exam; an oral exam reviewing the student's mastery of subject matter related to his/her thesis topic and the course work taken.
- After passing the A exam, candidates <u>must earn two additional registration units (semesters) before taking the final "B" examination</u>.
- You must submit a complete draft to all members of your Special Committee at least six (6) weeks before the final masters or B exam. (Your Special Committee may modify this requirement.) At least five (5) days before the exam, you must provide all members of your Special Committee with a complete, formatted, and editorially acceptable copy of the thesis or dissertation for final approval. (Your examining committee may still require modifications.) **Final Examinations may <u>not</u> be scheduled until this requirement has been met.** Code VI.G.4, *Guide to Graduate Study.* **You must submit a Schedule of Masters Exam form to the Graduate School at least seven days prior to your oral exam. The form can be found on the Graduate School website.**
- Ph.D. students are required to give a half-hour seminar presentation on their research proposal prior to the A exam, and one full-hour seminar presentation on findings of research prior to the B exam. Seminar presentations are expected to be given in the Section of Soil and Crop Sciences seminar series (PLSCS 6970: *Seminar in Soil and Crop Sciences)* during fall or spring semesters (other series will be considered upon request). Planning ahead for this is important.
- Pass the "B" exam or final examination which covers the subject of the dissertation.
- Teaching experience is required and can be satisfied by assisting a faculty member in teaching a course, working in extension, or taking an education course.
- Fulfill a minimum of 6 registration units, 2 of these between the A and B exam. For students completing an M.S./Ph.D., registration units beyond the 2 units required for the M.S. may be put towards the 6 registration units required for the Ph.D. (*Code of Legislation, V.C.).*
- Candidates must submit an acceptable dissertation based on a research project.

- While it is possible to complete Ph.D. degree requirements in three years, the nature of your research may require longer, in which case, requirements must be completed within seven years.

Coursework

The Graduate School has no course requirements for obtaining a **MS or PhD** advanced degree. Your course program is developed with the advice and direction of your special committee. Specific courses may be required by members of the committee and are usually suggested as a means to obtain essential training to save students from having to spend more time and effort in mastering the subject independently. Students should use their own judgment, along with the advice of their committee, in deciding which courses will provide the best training for future needs.

Graduate students must; however, be enrolled in at least one course with a minimum of one credit hour per semester. An exception to this would be students in the Employee Degree program (see below).

The International Students and Scholar's Office (ISSO) defers to the field or section regarding course requirements. As long as the student maintains adequate standing with his/her field or Section the U.S. Citizenship and Immigration Services (USCIS) or Department of State (DOS) do not impose additional requirements.

All students in the **Employee Degree Program** (EDP) are eligible to enroll in up to eight (8) credits per semester. While participating in the EDP, you are also eligible to enroll in more than eight (8) credits during any two semesters. During these two semesters, you may reduce your work status to no less than part time. EDP students have no anticipated graduation date, and they may take longer to fulfill their course requirements. For more information, please visit the Employee Degree Program website: https://hr.cornell.edu/benefits/education/edp.html.

The following are course guidelines for graduate students majoring or minoring in one of the concentrations in the Field of Soil and Crop Sciences. These guidelines were developed to promote a minimum level of knowledge and experience in the major and minor field. They are not intended to restrict students' options in pursuing independent and diverse course programs, but students are expected to adhere to these guidelines except under extenuating circumstances. The course guidelines may be met by equivalent courses taken at other institutions as part of earlier degree programs. In some cases, courses may be substituted for those in closely-related subjects offered in SCS or other departments. The seminar requirement is firm and must be met by all students. Satisfactory seminar attendance involves attending at least seven presentations for each semester. Sign in for seminar at sips.cals.cornell.edu/news-events/ seminar-check. Please note that in addition to the course requirements listed below, all Masters and Doctoral students should register each semester for 12 credits of Graduate Research Credits. Graduate students are expected to be engaged in graduate research full time and this effort is reported by registering for research credits. Students in absentia or on leave of absence do not register for research credits. Note, students can register for a maximum of 22 total credits per semester (including research credits and course credits). Course codes for masters/doctoral level research credits are: 8200/9200, 8600/9600, 8800/9800 for crop sciences, environmental information sciences, and soil sciences and respectively. Concentration of SOIL SCIENCE Major Degrees MS and MPS (Agriculture and Life Sciences) degrees: 12 credits of soil science courses, of which at least 8 credits are at the 4000 level or above, and 3 are at the 6000 or 7000 level (research credits are excluded). Two semesters of a seminar course of which at least one is PLSCS 6970, and one graduate course in Statistical Methods. Ph.D. degree. Same as for MS plus 12 additional credits from major or minor fields, of which 6 are at the 6000 or 7000 level (research credits are excluded), and two additional semesters of a seminar course, of which at least one is PLSCS 6970. Minor Degrees

All degrees: 6 credits of courses in soil science. 5 Concentration of CROP SCIENCE Major Degrees MS and MPS (Agriculture and Life Sciences) degrees: 4 credits of plant physiology, 8 credits of crop science of which at least 3 credits are at the 6000 or 7000-level (research credits are excluded), two semesters of a seminar course of which at least one is PLSCS 6970, and one graduate course in Statistical Methods. Ph.D. Degree: same as for MS plus 12 additional credits from major or minor fields, of which 6 are at the 6000 or 7000 level (research credits are excluded), and two additional semesters of a seminar course, of which at least one is PLSCS 6970. Minor Degrees: all degrees: 6 credits of courses in crop science. Concentration of AGRONOMY Major Degrees MS and MPS (Agriculture and Life Sciences) degrees: 4 credits of crop science, 4 credits of soil science, 3 credits of 6000- or 7000-level crop or soil science (research credits are excluded), two semesters of a seminar course of which at least one is PLSCS 6970, and one graduate course in Statistical Methods. Ph.D. degree: 6 credits of applied crop science, 6 credits of soil science, plus 9 credits of 6000 or 7000-level courses from the major or minor fields (research credits are excluded), and two additional semesters of a seminar course, of which at least one is PLSCS 6970. Minor degrees: all degrees: 6 credits of courses in crop science or soil science. Concentration of ENVIRONMENTAL INFORMATION SCIENCE (EIS) Major Degrees MS and MPS (Agriculture and Life Sciences) degrees: 15 credits of EIS and related courses (as listed below), of which at least 3 are at 6000 or 7000 level (research credits are excluded). Two semesters of a seminar course of which at least one is PLSCS 6970, and one graduate course in Statistical Methods. Ph.D. degree. Same as above plus 12 additional credits from major or minor fields, of which 6 are at the 6000 or 7000 level (research credits are excluded), and two additional semesters of a seminar course, of which at least one is PLSCS 6970. Minor degrees: all degrees: 6 credits of courses in EIS. EIS Courses (not exhaustive): Geographic Information Systems and Technology including: Geographic Information Systems; Spatial Modeling and Analysis Statistical/Mathematical Modeling including: Statistical Methods; Spatial Statistics; Quantitative Statistics; Space-Time Statistics; and Data Mining Earth Measurement including: Resource Inventory Methods; Remote Sensing and Digital Image Processing; Environmental Biophysics; Global Positioning System Environment including: Soil and Water Sciences; Ecology; Natural Resources; Biological and Environmental Engineering; Ecology and Evolutionary Biology; and Environmental and 6 Resource Economics. Computing including: Programming; Modeling; Database Management; and Computational Methodologies.

Assistantships

Most graduate students in the Field of Soil and Crop Sciences are assigned on a half-time basis as Teaching Assistants (TA), Graduate Assistants (GA), Research Assistants (RA), or Extension Assistants (EA). Their assignment time may be distributed throughout the year in various ways, depending on the requirements of the project. Graduate Assistants generally work more than half time (15 -20 hours a week) during the summer and have more than enough time for their studies during the academic year.

There is likely to be an occasional demand on the student's time. Assistantship assignments should not be so engrossing that graduate work is neglected, nor should the opposite occur. Time management is extremely important and will reflect recommendations for future Section positions and after graduation.

Graduate TA Policy

Background:

The faculty in the graduate Field of Soil and Crop Sciences believe that it is important for graduate students to participate in activities that support the section, while simultaneously gaining experiences that will be useful in a career. Graduate students are expected to contribute to the section/field in meaningful ways, particularly if support is coming from a section assistantship. A major way that graduate students contribute is by serving as a teaching assistant. Nearly all graduates will eventually be in a position where they have to teach others. In order to have a well-rounded education, we expect all students to have substantive and meaningful experience teaching. Serving as a teaching assistant (TA) or, in exceptional circumstances, playing a major teaching role in extension/outreach programs, can satisfy this expectation.

All graduate students supported by the Field of Soil and Crop Sciences are expected to contribute to Section teaching, research and outreach efforts, in accordance with their interests and abilities, and the needs of the Field and Section. In turn, the Field and Section will strive to allocate TA responsibilities and other Section assignments equitably and fairly among all graduate students.

In addition, when a student's limited proficiency in English prevents them from serving as a TA in the classroom, or a suitable TA experience cannot be found, the student may be required to take a course aimed at developing his or her English proficiency and teaching skills in order to teach in the future; or they may be asked to help out with section activities such as web site development, curriculum or outreach program development and delivery, to satisfy the obligations of accepting section assistantship support.

Policies:

- All MS and PhD students regardless of funding source are required to serve as TAs, or provide some equivalent service in curricular activities during their time at Cornell.
- MS and PhD students funded on an assistantship or endowment from the Section of Soil and Crop Sciences may be required to TA during each semester. Such expectations will be spelled out in their acceptance letter. Faculty members shall accommodate the need for their graduate students to TA, and alter research and coursework expectations accordingly. Every effort will be made to ensure that teaching or section curriculum assignments are distributed fairly and that any special circumstances of individual graduate students are considered. Students with previous coursework and expertise in a particular area may be required to TA courses in that area, and that expectation may be stipulated as a condition of their financial support by the Field of Soil and Crop Sciences when they are accepted into the graduate program. Faculty will advise students if they need to take or audit a course in order to gain more expertise in an area where they will be TA-ing. For multiple semesters of funding, students are encouraged to apply for BIO TAships.
- Students supported by a Graduate School Fellowship shall not be required to serve as a TA during their fellowship year.
- If an extension/outreach teaching experience is substituted for classroom TA-ing, the student's major professor, DGS, and committee will have to approve the substitution. This should include a plan that helps the student achieve the equivalent educational goals of classroom teaching.
- No extra Soil and Crop Sciences Field funding is allocated for students who TA.
- ***Students will keep the Graduate Field Assistant, informed of their TA or equivalent experiences so accurate records can be kept.***

- All instructors should meet with and discuss what is expected of the TA prior to the beginning of class. Students should also discuss what they want to gain during the TA experience with the instructor.
- Any dispute regarding the assignment of TA's may be addressed to the student's major advisor in consultation with the DGS.

Research Abroad Guidelines

(While these are not strict requirements, justification of any deviations from these guidelines should be described fully as part of the student's annual Soil and Crop Sciences review.)

A research program should be well developed before the student goes abroad. This includes: a) demonstrating a good understanding of the system they are working in. b) a literature review of the type of research that has been done in their area of interest. c) developing clear, testable hypotheses that will likely make significant contributions to the field of Soil and Crop Sciences.

The student should satisfactorily complete their A-exam before leaving to embark on research abroad.

Graduate student research should be conducted at an established regional, national or international center or university. Arrangements for funding, housing, field and laboratory facilities (including accessibility to email) and personnel support should be fully arranged in advance and agreed to in writing by the potential advisor, her/his unit head, and funding agencies supporting the research and the student. Cornell commitments also should be expressed in writing and communicated to the overseas advisor and unit head.

At least one person at the institute who is willing to act in an advisory role to the student should be identified before student departure. This person should have qualifications or expertise similar or equal to those of a graduate field member at Cornell and must be approved by the chair of the student's graduate committee.

If possible, a member of the student's special committee should visit the student and inspect their work at least once while the student is abroad. On completion of their international research, the student should return to Cornell and complete their dissertation before embarking on new international projects.

Fellowships & Other Funding Sources

Fellowship information is available from the Graduate School, 143 Caldwell Hall, or www.gradschool.cornell.edu. Additional information is usually forwarded via e-mail to the graduate student list in the Section when it becomes available.

Performance Guidelines and Requirements

Course Performance

Course guidelines have been developed to promote a minimum level of knowledge and experience in the major field and concentration (see Course Guidelines). Students are expected to adhere to these guidelines except under extenuating circumstances, in agreement with the special committee and the graduate field. Any course grade of C+ or lower, a grade of "incomplete", or an overall GPA below 3.0, does not constitute satisfactory course performance. Students whose overall GPA drops below 3.0 are considered to be "on probation" and will receive a notice from the Director of Graduate Studies (DGS). Research credits are assigned S/U grades only, and are excluded from the overall GPA. A student on probation has one semester to improve his or her course performance, or the field may elect to discontinue the

student's field membership. Extenuating circumstances will be discussed in the annual review meeting (see below). The above criteria are minimum performance criteria, and do not exclude special committees from setting more stringent criteria for individual students.

Research Performance

Research performance is evaluated by the special committee. The field expects the research to be original and substantive, and meet the requirements of the special committee. Students are equired to develop research proposals that are presented to the special committee and are filed with the Graduate Field Assistant (GFA) (see Review Process below).

Teaching Experience

For the Ph.D. degree, the field requires that all students gain experience in teaching. This requirement can be satisfied by assisting in the teaching of an entire course (as a TA), or by assisting a faculty member in other projects associated with teaching that meet the approval of the special committee chair and the DGS. Examples of such teaching experience are the development and offering of lab exercises, a module of several lectures to improve a course, or by assisting in the development of an extension workshop or teleconference. Exceptions to this requirement may be granted to students who have extensive prior university-level teaching experience.

Seminar

The field requires that each M.S. and M.P.S. (Agriculture and Life Sciences) student present a half-hour seminar presentation on their research prior to degree completion. Ph.D. students are required to give a half-hour seminar presentation on their research proposal prior to the A exam, and one full-hour seminar presentation on findings of research prior to the B exam. Seminar presentations are expected to be given in the Section of Crop and Soil Sciences seminar series during fall or spring semesters (other series will be considered upon request.)

Leave of Absence

A leave of absence can be granted for personal or medical reasons, but the process is different for each type of leave. A health leave of absence requires filing with Gannett Health Services. More information is available at www.gannett.cornell.edu/HLOA.html

The maximum number of years allowed for leave of absence is four. A student who takes a leave of absence relinquishes the access to campus facilities and personnel that normally accompanies student status. For more information see the Code of Legislation: www.gradschool.cornell.edu/code or obtain information directly from the Field Grad School Rep, 143 Caldwell Hall or your Soil and Crop Sciences Grad Field Assistant.

In Absentia

In absentia status provides an opportunity for graduate students to engage in approved study in a location at least 100 miles away from the University's Ithaca campus during the academic year while continuing to work under the guidance of the Special Committee. You can earn 1 registration unit (RU) if the arrangement enhances the student's program of study. For more information see the Code of Legislation: www.gradschool.cornell.edu/code or obtain information directly from the Field Grad School Rep, 143 Caldwell Hall or your Soil and Crop Sciences Grad Field Assistant.

Student Progress Report

The Student Progress Review (SPR) requirement was implemented in 2017 at the request of students and faculty to support the regular exchange of constructive, written feedback between advisees and advisors. It codifies a process for research degree students and their special committees to have at least one formal conversation per year about academic progress and future plans. Using the SPR form, students are asked to reflect on their recent accomplishments, identify challenges, and set goals. Committee chairs then review their students' SPR forms and enter constructive feedback. Chairs indicate whether progress has been excellent, satisfactory, needs improvement, or is unsatisfactory. Feedback that is documented on the SPR will be made available to the student, all members of the student's special committee, and the DSG/GFA of the student's field. These are due annually, by May 1.
https://dynamicforms.ngwebsolutions.com/Submit/Form/Page?form=717f5341-bc13-4041-9959-e9242cdbec2b&page=97999&section=74296&token=AxNcr%2FO4q5Y2czUcFF34En6aun6QWhFNaLShG0iFL6Y%3D

Examinations

All members of the graduate faculty are notified of examinations and all are welcome to attend. Students are responsible for notifying the graduate field assistant **at least two weeks in advance** to reserve a room (or reserve room using this link) and send a notice to graduate faculty. Students must submit a Schedule of Exam form for all exams to the Graduate School **at least one week in advance** otherwise the exam results are not valid. Extensive information on Exams, Doctoral Dissertation and Master's Thesis production can and should be obtained from the Graduate School. Note: All research degree candidates (M.S. and PhD) must apply for graduation using the **Graduation Manager** (Online) system during the semester prior to their anticipated conferral date. Even if your degree does not require a thesis or dissertation you must still apply for graduation. Ask your GFA for clarification if you are unsure. After each examination, a **Results of Examination** form must be filled out and submitted to the Graduate School within three business days and a copy to the graduate field assistant. (Forms can be found at https://gradschool.cornell.edu/forms).

A Exam

Exam for Admission to Doctoral Candidacy for PhD students

A comprehensive exam given by the student's committee to test his/her general knowledge in the areas of soil and plant sciences and related fields relevant to the student's PhD program in Soil and Crop Sciences. It is designed to determine your ability to begin research. It is *not* to discuss your specific research topic or research results although it may enter the discussion. Although questions of specific factual nature are common, emphasis is also placed on your ability to utilize and synthesize your knowledge to address more complex problems. A minimum of 3-hours should be scheduled; although there is no time limit, some have gone more than 4-hours. It is typically an oral exam and some written questions are allowed if a faculty member so chooses. It is appropriate and useful to discuss examination expectations with your committee members well in advance of the exam. Other faculty members in the Field are invited to participate, are allowed to ask questions, and typically do not ask many questions. Each exam is unique. Therefore others' experiences only represent what can happen, not what will happen.

The student generally provides a list of courses s/he has taken as a graduate student. Questions relating to these classes as well as background information relating to the student's current research are fair game. You are encouraged to chat with each of the committee members to get a sense of topics that the committee member may ask about.

By Graduate School rules, this exam must be taken a minimum of 1 year before the thesis defense exam.

B Exam

Final Defense for PhD or Thesis Defense Exam for MS. PhD students must have earned at least 2 registration units (RU) between the passing of the A exam and the scheduling of the B exam.
The "Doctoral Dissertation, Master's Thesis, and Advanced Degree Requirements" guide has the detailed instructions and procedures (Thesis Advisor link at: www.gradschool.cornell.edu). The Thesis Advisor also maintains a resource list of typists, editors, and couriers.

This oral exam will discuss the student's research and dissertation or thesis manuscript. It is expected that at the start of the exam the student will prepare and give a brief 10-15 minutes oral presentation of the main methods and results of the project to set the stage for the discussion and to demonstrate the ability to present their work. Questions may address the scientific background of the research and hypotheses, the general approaches and specific methods used, the results, and the interpretation of the results. At least 3-hours should be scheduled for the PhD and 2-hours for the MS thesis defense. Normally, there are some changes required in the dissertation or thesis after the exam and may require from a few days to a few weeks to complete.
A suggestion: In general it is extremely difficult to re-write thesis chapters for journal publications after a student has left to assume new duties elsewhere. It is recommended that the thesis be written in the "manuscript" format where the publishable chapters are in the complete form of a manuscript for submission to a scientific journal. The publisher will then require only minor editorial revisions and it can be submitted quickly.

Thesis - Dissertation

Thesis or Dissertation Deadlines (Code VI.G.4) *Guide to Graduate Study*:
You must submit a complete draft to all members of your Special committee at least six (6) weeks before the final masters or B exam; however, your Special Committee may modify this requirement. At least five (5) days before the exam, you must provide all members of your Special committee with a complete, formatted, and editorially acceptable copy of the thesis or dissertation for final approval but keep in mind, your examining committee may still require modifications. **Final Examinations may not be scheduled until this requirement has been met.**

When you have a finished an approved manuscript:
The Grad School encourages all students to submit their final, approved thesis on-line using Graduation Manager, www.gradschool.cornell.edu. This requires you to convert your document to PDF format. The approved digital document is automatically forwarded to a local printer. Any charges, including printing, will appear on your bursar bill.

MS – Submit the thesis electronically through the Graduate School website, Graduation Manager link at www.gradschool.cornell.edu. Follow the directions via Graduation manager re: University requirements when ordering your thesis copies.

PhD – Submit the thesis electronically through the Graduate School website, Graduation Manager link at www.gradschool.cornell.edu. Follow the directions via Graduation manager re: University requirements when ordering your thesis copies.

Complete details for thesis and dissertation submission requirements can be found at the Graduate School website: http://www.gradschool.cornell.edu

Publishing Your Research Work

Students are encouraged to publish their research results in professional journals so their work can be widely disseminated. This is easily accomplished if the thesis is organized and written with this intent. Professional journal articles are a source of pride for the student, enhances career opportunities, and reflects well on the reputation of the Section. Few academicians read theses from other institutions, so the only practical way of sharing scientific contributions is through professional journals. If you expect to publish part, or all, of your thesis, you will be required to sign **a License to Use Copyrighted Material** form with the Thesis Advisor at the Graduate School.

Commencement

Information on degree conferral dates, commencement and diploma distribution can be obtained from the Thesis Advisor at the Graduate School, 350 Caldwell Hall, 255-5810, or http://commencement.cornell.edu/.

Section Hours

Working hours for Section staff (offices and facilities) are: Monday through Thursday, 8:00 am-4:30 pm; and Friday, 8:00 am-3:30 pm. Some offices such as the greenhouses, farm, or orchards may vary. Laboratories and graduate student offices are usually accessible 24-hours a day.

Orientation of Facilities Use

We are required by law to make certain that all users of chemicals, equipment, and facilities are familiar with potential hazards and appropriate safety precautions. Graduate students are required to attend orientation and training sessions before using any of the laboratory, growth chamber, greenhouse, or field research facilities. Orientations for facility usage are held regularly and graduate students should watch for announced times (usually by e-mail).

If you are unable to attend, please contact the person in charge of orientation to make other arrangements. Do not use a facility or hazardous equipment if you have not been through the appropriate training session!

Right to Know

Federal and New York State law mandates and the university requires that all graduate students and employees attend an orientation on the "Right to Know" Act. This introduces the law, the Material Safety Data Sheets (MSDS), general toxicology and laboratory safety. You

will receive a memo with times and locations of the orientation meetings. You will also receive a Safety Guideline checklist, mandated by the University, and you are required to return the checklist to the Section safety representative. Safety Information notebooks are available for your reference in the main offices and in the Section laboratories. You will receive an index to the notebook as a quick guide to its contents.

Laboratories and Equipment

Most research projects and professors have one or more laboratories with research equipment. Students will normally use of their advisor's laboratory and equipment. To use other equipment in the Section, permission should be obtained from the professor involved. Laboratory space is assigned by the major advisor. Equipment, glassware, reagents, etc. are generally purchased to use in specific laboratories. They should not be transferred to other locations unless approved by the faculty member in charge. Before using laboratory equipment, students are expected to obtain permission and instruction from the faculty member in charge or his/her designate. Each student is responsible to keep their work areas clean. Laboratory supplies or other purchases should be approved by the student's major advisor. Disposal of toxic materials must follow proper safety procedures. See the appropriate Radioactive Material Permit Holder about use and disposal of radioactive materials.

Growth Chambers

Growth chambers, both reach-in and walk-in, are available for research use. Fees are paid by the research project and professor involved. At the beginning of each semester a meeting is held to establish growth chamber assignments. Be sure to clear the availability of funds with your major professor before reserving growth chamber space. There is high demand for this and the Section makes every effort to accommodate everyone's needs.

Greenhouses

Requests for Section greenhouse space should be approved by your major advisor beforehand. Guterman space requests are made through the greenhouse superintendent. Greenhouse space at Kenneth Post Lab (KPL) is arranged through the greenhouse manager.

Field Research

Requests for experimental field plots are made early each spring and must carry the endorsement of the major advisor. Policies and procedures will be explained at an orientation and training session for field research.

Computing and Multimedia Facilities

Computer support for personal computers and Section-owned equipment is requested via a Remedy Incident Ticket: http://cals.cornell.edu/cals/cals-it/remedy.cfm. New graduate students will need to have an anti-virus program installed and have their computer scanned, before they can get on our wired network. This process can take a half day or so. Please be prepared to leave your computer in the IT office (Rice 105) for this procedure. RedRover wireless can be accessed without any scanning: http://www.it.cornell.edu/services/redrover/.

Students should read the, "Plant and Environmental Sciences - Faculty, Staff and Student Employee - Information Technology Orientation" packet: http://peit.cals.cornell.edu/files/2014/07/PEIT-Orientation-2014July28-2f4xqqi.pdf to quickly become familiar with our IT support services.

Security

While campus is a generally a safe place, theft does occur and we urge you to be mindful of your and others property. Keep offices and valuables locked up, and secure windows upon leaving for the day. Shut down computers, especially after using email. Keep backup copies of all your important work. Keep graduate student office doors closed at all times.

Desk Assignments

The section has several rooms in Bradfield Hall set aside for graduate students to share, and a desk will be made available for each graduate student upon their arrival. A student will be assigned and occupy only one desk regardless of location. Assignments will be made by the graduate field assistant. Students on a Leave of Absence or with space elsewhere may be asked to forfeit their desk space to others, if there is a need for space when new students arrive. Students should not "take over" another desk area while they are here; and they must empty and clean their assigned desk prior to departure.

Travel

Graduate students are encouraged to attend and participate in industry oriented conferences/meetings. Attendance is also encouraged at national and regional scientific meetings. In the course of a student's research, the major advisor may agree to reimburse a portion of the expenses for attending a scientific meeting. It will be up to the advisor to decide if funds are available. Additional assistance may be obtained by applying in advance to the Graduate School for a special travel grant, which pays for transportation costs but only when presenting a paper/poster. The Graduate School also provides grants up to $2,000 to research degree students to conduct thesis/dissertation researcher. Priority is given to those who have or will have completed their A Exam by the date of travel. Prior to your trip, give your advisor the following information: destination, departure and arrival time, date, purpose of trip. You must file a "Notice of Proposed Travel" for insurance purposes, and also if you need a travel advance. In order to get reimbursed, you must submit all original receipts and complete an expense report upon your return. Please see the Travel Funding Opportunities page on the Cornell Graduate School Website for more information.

You may also apply for a travel grant from the Section of Soil and Crop Sciences for up to $400 per year. This form is found on the SCS website.

Section Vehicles

Use of university/section vehicles by graduate assistants is authorized for university business only, such as carrying out research or other university projects. You must be registered to drive these vehicles. For insurance purposes, **family members or friends are not permitted to ride in or drive university/Section vehicles at any time unless they are Cornell employees and registered.**

State Fleet vehicles

The Fleet Services, *Fleet Policy Manual* can be found here: http://transportation.fs.cornell.edu/fleet/policy.cfm#About. Fleet cars are available for official use. Permission from major advisors is required. Charges are made on a mileage or per day basis to Section accounts; an account number is required when reserving a fleet vehicle. Reserve a car or van as early as possible; and should you need to, cancel immediately to avoid a charge (24-hours prior to departure). The actual driver must pick up the fleet car. Students must have a valid driver's license, be registered at the Fleet Garage, and be pre-approved by the Risk Management Office. In order to do so, you must fill out a form available on-line at the Cornell Transportation website: http://transportation.fs.cornell.edu/fleet/reserving/default.cfm - click on **"Step 1: new request" link.**

"**Authorized Drivers**: A member of the Cornell community who has been authorized by an operating unit to drive one of its vehicles for university-related business." (*Use of Cornell Vehicles*, Policy 3.4). Fleet vehicles *cannot* be used for personal business nor may the vehicle be used in commuting to and from an individual's place of residence. Members of an employee's family, or other unauthorized passengers not associated with the University, may not ride in a fleet vehicle. For clarification and/or policy exceptions re: passengers contact the Contract College Fleet Supervisor (607-255-3247).

Note: If the vehicle is involved in an accident, please obtain complete information. Use the form enclosed in the book in the glove compartment for the preliminary report. Notify Fleet Services immediately in the event of any accident. Please refer to the *Fleet Policy Manual* for more information: http://transportation.fs.cornell.edu/fleet/policy.cfm#Accidents.

Farm Equipment

Farm equipment can be used upon approval of the farm/orchard manager after a short vehicle-safety-training course.

Keys

Keys are available for various Section facilities based on need. Key requests should be directed to our Administrative Manager, Leslie Larsen.

Purchasing

During the course of your graduate study it will be necessary to obtain various items essential to your research. Be sure to check with your major advisor for availability of funds and an account number before placing an order. Items may be obtained in a number of ways. Check with your major advisor or one of the sections accounts representatives for catalogs. It is important to plan ahead for your needs.

Copy Machine Privileges

Graduate students who have received approval from their advisor may use the copy machine for materials that are connected with their assistantship assignments and/or thesis research. If the student is a TA for a Section course, copies may be made.

Copying of books is not permitted on the section copiers; these machines are not designed to do so and could cause the glass to break. Use one of the copiers in Mann Library. *Please do not violate copyright laws.*

Mail

Mail is collected and distributed by Barb in the mailroom on the ground floor. Mail is sorted daily. Please have only university-related business delivered here. UPS is preferred for package deliveries, not via the United States Postal Service (USPS).

- Due to on-campus postal regulations, a *Postal Change of Address* notice cannot be used to forward your mail.
- Note: The Section cannot forward your mail. Please plan ahead and provide your contacts with your new address.

Postage

The Section does not provide postage for personal use, such as reprint requests, position inquiries, mailing of resumes to prospective employers, etc.

Room Scheduling

Room scheduling for meetings or exams (A or B) should be done via LibCal http://sips-cornell.libcal.com/spaces?lid=1636&gid=0.

PLSCS 6970: *Seminar in Soil and Crop Sciences*

Section seminars are held weekly for faculty, staff, and graduate students during the academic year. All graduate students are expected to attend at least 7 each semester unless they have a course conflict, and they should register for PLSCS 6970 to receive credit.

SCS Graduate Student Organization

The GSA is the academic and social organization of the faculty, graduate students and alumni of the section of Soil and Crop Sciences at Cornell University. All Soil and Crop Sciences graduate students are automatically members. The objective of the GSA is to stimulate professional and social interaction among members of the Cornell community interested in Soil and Crop Sciences and to improve the quality of Soil and Crop Sciences education at Cornell.

Forms

There are forms for everything you would like to do in regards to your graduate program. These include, but are not limited to, scheduling exams, exam results forms, leave of absence, in absentia, petitions, travel grants, etc. Forms can be found on the Graduate School website at https://gradschool.cornell.edu/forms. There are also section forms that can be found on the Soil and Crop Sciences website https://scs.cals.cornell.edu/graduate/current-students/.