Graduate Student Academic Policy Handbook

Department of Horticulture
2024

Table of Contents

The Graduation Education Committee & DOGE

(DOGE = Director of Graduate Education)

Faculty on the Graduate Education Committee are charged with the responsibility of making recommendations to the entire faculty concerning graduate programs in horticulture. Specific responsibilities of the committee include the following.

1. Establish admission requirements and policies for M.S. and Ph.D. programs.

2. Implement admission requirements through review of applications for graduate study.

3. Publicize and promote graduate programs in horticulture at Iowa State University.

4. Oversee annual reviews of horticulture major doctoral students as required by the Graduate College.

The committee acts in an advisory capacity. Its recommendations must be approved by the departmental faculty, the director of graduate education, and/or the department chair.

Dr. Rajeev Arora serves as Horticulture's Director of Graduate Education (DOGE). In this role, Dr. Arora represents the Horticulture graduate major during interaction with the Graduate College. Dr. Arora should review any forms you may have that require the signature of the DOGE.

Learning Goals for MS and PhD students – Horticulture

1. Through coursework and research, be familiar with and understand scholarly literature in the area of study.
2. Be able to formulate testable hypotheses and justify research objectives.
3. Conduct laboratory and/or field research by working effectively with appropriate instrument, equipment, technologies and experimental systems.
4. Interpret research results via appropriate acquisition and analysis of data, and integrate them into the existing knowledge in the discipline.
5. Conduct scholarship, in teams or independently, in ways that demonstrate ethical practice and professionalism.
6. Clearly and accurately communicate research findings orally and in writing through scholarly presentations.

Requirements, Expectations, and steps for Completion of Graduate degree in Horticulture

This description is a summary of requirements. Students should obtain copies and thoroughly read the *Graduate College Handbook* and the *Graduate College Thesis Manual*. These two documents provide additional details on procedures and requirements for successful completion of the Ph.D. or M.S. degree.

Master of Science (with thesis)

The Master of Science program is research oriented and is intended to prepare the student for further graduate study or for positions in industry or education.

Students working for an M.S. in Horticulture are expected to complete at least 30 semester credits with at least 22 of these credits from Iowa State. These 30 credits must include Hort 5300 (Research Orientation), Hort 6100 (Seminar; at least 1 credit), and Hort 6980 (Teaching Practicum) (**Table 1**); see more on Teaching Experience on page 9. In addition to course-work requirements (see more on required courses in Table 1), students are expected to complete a thesis produced from their original research. Students who prepare a thesis must take research credits (Hort 6990) that are designed to account for time devoted to conducting research.

Students who pursue a non-thesis master's rather than a thesis-based Master's register for Hort 5990 instead of Hort 6990 (refer to Master of Science (non-thesis) for more details). Students majoring in horticulture and desiring to minor in another discipline may do so with the approval of the minor program. The minor program establishes the requirements for the minor and must approve the plan of study before it is submitted to the Graduate College. Additionally, a faculty member from the minor program must serve on the graduate committee.

After a student has identified a research topic and a major professor, a graduate committee or Academic Program of Study committee should be established. The student should consult with the major professor in determining the members of this committee. Determining members of the graduate committee is an important decision because this committee will oversee the student's program. The M.S. graduate committee must consist of at least three graduate faculty; at least two of these must be from within the department and one must be from outside of the student's major department. Graduate committees and Program of Study are established by completing the Academic Plan of Study form, available via Workday. The graduate committee must be established before or at the same time a program of study can be submitted to the Graduate College.

The Academic Plan of Study form is completed by the student and major professor and approved by the student's graduate committee. This form outlines the courses the student will take and lists the student's preliminary research thesis title. Courses listed on this form must be completed by the student. Additional courses not listed on the form may be taken.

The student should work closely with the major professor and the graduate committee in conducting and reporting the research. The major professor and graduate committee will need to approve the thesis before completion of the degree.

The following course-work policy applies to M.S. students and to Ph.D. students who have not met the requirement during an M.S. program at Iowa State. All horticulture majors and co-majors must complete at least six (6) credits of approved Hort. graduate courses (see **Table 1 on page 4**). Most horticulture courses at the 5000 and 6000 level may be used to meet the requirement. This table also lists horticulture courses that are **not** intended to meet the graduate credit requirement for an M.S. or Ph.D. degree program.

With permission of the student's Academic Program of Study committee some 3000 and 4000 level courses may be used to meet degree requirements. See Graduate College Handbook for details.

Master of Science (non-thesis)

The department also offers a 'non-thesis' M.S. degree. A bachelor's degree in any major from any institution with at least a 3.0 GPA is required to be admitted in this program. A complete application including undergraduate transcripts, at least three letters of recommendation, a statement of purpose (one-page essay), and a current resume must be submitted to the Graduate College (application deadlines are the same for all degree programs). The total number of semester credits required for non-thesis masters is 30. At least 22 of these must be from courses other than the 'creative component' and determined by the student's Academic Plan of Study committee (advisor plus two members of the graduate faculty). Non-thesis master's students are expected to prepare a 'creative component' rather than a thesis and register for Hort. 5990 (minimum 2 credits) instead of Hort. 6990 (**Table 1**). The project for creative component, determined by the student and Academic Plan of Study committee, will involve advance level scholarship or an original/unique contribution to horticulture. This degree is generally used by students who are employed in jobs outside of the university and wish to complete the M.S. without returning to the university full time. While completing the non-thesis M.S. does not preclude the pursuit of a Ph.D., it is recommended that students who are planning to pursue a Ph.D. enroll in the thesis option.

Table 1. The following table lists courses and credits for Horticulture Graduate Students (Ph.D. or M.S.) needed for their degree program.

Required Courses	**PhD**	**MS (Thesis)**	**MS (Non-Thesis)**
Hort 6100 (Fall/Spring) *Graduate Seminar*	☐ **2 (2 seminars during degree program)**	☐ **1**	☐ **1**
Horticulture Courses • Hort. 5300 (Fall) *Research Orientation* • Hort 6980 (Spring) *Teaching Practicum* • Approved Hort. Graduate Course(s)*****	**6 total** ☐ **2** ☐ **1** ☐ **3**	**6 total** ☐ **2** ☐ **1** ☐ **3**	**6 total** ☐ **2** ☐ **1** ☐ **3**
Additional Classroom/ Lab Courses**	☐ **Agreed upon by POSC**	☐ **Agreed upon by POSC**	☐ **Agreed upon by POSC**
Hort 6990- *Research Credits* / Hort 5990-C*reative Component* (if non-thesis)	☐ **Agreed upon by POSC**	☐ **Agreed upon by POSC**	☐ **Min 2, Max 8**
Total Credits Required	**72 (Coursework + research** credits) (36 cr. from ISU)	**30** (**Coursework** + **research** credits) (22 cr. from ISU)	**30** (22 from courses other than HORT 5990 - C*reative Component*)

*****The following is a list of Approved Horticulture Graduate courses, as of August 2024, to meet graduate course requirement, in addition to Hort. 5300, Hort. 6980, and Graduate seminar(s):

Approved Horticulture Graduate courses to meet graduate credit requirement

Hort 5060: Crop Genetics (3 Credits) (*Spring, Even*)
Hort 5110: Integrated Management of Tropical Crops (3 Credits) (*Spring, Odd*)
Hort 5240: Sustainable and Environmental Horticulture Systems (3 Credits) (*Spring*)
Hort 5380: Seed Physiology and the Environment (2 credits) (*Fall, Even*) **OR Hort 5430:** Seed Physiology (2 credits) (*Fall, Even*). Only one will count toward the requirement.
Hort 5420(A-G): Introduction to Molecular Biology Techniques (each class worth 1 Credit)
Hort 5510: Growth and Development of Perennial Grasses (2 Credits) (*Spring Even*)
Hort 5520: Integrated Management of Diseases and Insect Pests of Turfgrasses (3 Credits) (*Spring Even*)
Hort 5710: Vegetable Production and Management (2 Credits) (*Spring Even*)
Hort 5710L: Vegetable Production and Management Lab (1 Credit) (*Spring Even*)
Hort 5760: Horticultural Postharvest Technology (3 Credits) (*Fall Odd*)
Hort 5810: Experience in Plant Science Extension and Outreach (1 Credit) (*Summer Odd*)
Hort 5840: Organic Agricultural Theory and Practice (3 Credits) (*Spring Odd*)

GRST 5360: Preparing Publishable Thesis Chapters (2 credits) (Fall/Spring) (not a Hort. graduate course but is counted towards meeting Horticulture graduate credit requirement.

Table continued on next page

Courses not intended to meet the Horticulture graduate credit requirement:

Hort 5900 - Special Topics
Hort 5930 - Workshop in Horticulture
Hort 5990 - Creative Component
Hort 6900 - Advanced Topics
Hort 6960 - Seminar in Plant Physiology and Molecular Biology
Hort 6990 - Thesis and Dissertation Research

** Courses not restricted to Horticulture, such as Statistics, Agronomy, Biochemistry, Genetics, Plant Physiology, Sustainable Agriculture, or any other graduate courses approved by Academic Program of Study committee.
With permission of the student's Academic Program of Study committee some 3000 and 4000 level courses may be used to meet degree requirements. See Graduate College Handbook for details.

The Ph.D. Program

The Ph.D. degree is intended to prepare you for a career involving research. Central to this degree is the development of a dissertation that demonstrates a creative, original, and significant contribution to the body of information on horticultural science. You also must demonstrate a deep and broad knowledge of horticulture during preliminary examinations administered by your Academic Program of Study committee.

Academic Program of Study committees for Ph.D. students must consist of at least five members of the graduate faculty. At least three of these must be from within the department and at least two members must be from outside of the horticulture department at Iowa State. Regular meetings, either formal or informal, with your committee members are recommended throughout your degree program.

At least 72 graduate credits must be earned before a Ph.D. can be granted (**Table 1 on page 4**). At least 36 credits must be earned at Iowa State, including all dissertation research credits. **Hort. 5300 (Research Orientation), two credits of Hort. 6100 (Seminar), and Hort. 6980 (Teaching Practicum) are required (Table 1);** see more on Teaching Experience on page 9**.** Doctoral students deliver one seminar early in their program to describe planned research; another seminar is given near graduation to report results and conclusions. Some credits from other institutions may be applied to your Ph.D. program at Iowa State; see Graduate College Handbook for details. The Graduate College Handbook also contains information on earning a minor and pursuing double majors. All horticulture majors and co-majors must complete at least six (6) credits of approved Hort. graduate courses (see **Table 1 on page 4**). Most horticulture courses at the 5000 and 6000 level may be used to meet the requirement. This table also lists horticulture courses that are **not** intended to meet graduate credit requirement for M.S. or Ph.D. degree program.

Ph.D. students must pass a preliminary examination. This exam is administered by all members of the Academic Program of Study committee or by approved substitutes if a committee member is unavailable. An oral examination is required, and most Academic Program of Study committees give a written examination before the oral examination. The exam is comprehensive and is not limited to specific information contained in graduate courses or information directly related to the student's dissertation research. **The exam must be completed successfully at least six months before the final examination.** You must obtain forms to schedule a date, time, and location for your preliminary examination. Another form is required for reporting the results of the examination to the Graduate College.

You must apply to graduate by completing an application for graduation, available from the Graduate College Website. These documents also describe several important rules

concerning the preparation and deposit of the dissertation. This topic is considered in depth in the *Graduate College Thesis Manual*. Remember to provide a copy of the dissertation to your major professor.

Final examinations are given to Ph.D. students after all other work toward the degree has been completed. The final exam is oral, but a written exam may also be administered by one or more committee members. Final exams are intended primarily to be a defense of the dissertation.

Preliminary Examination of Ph.D. Students

Students enrolled in a Ph.D. program of study are required to take and pass a preliminary examination before becoming a formal candidate for the Ph.D. degree. A Request for Preliminary Examination Form must be submitted to the Graduate College by the major professor at least two weeks before the proposed date of the examination. The preliminary examination is usually given before all coursework is completed and must be passed prior to the final examination. The preliminary examination may consist of two parts. The first part is an optional written examination, and the second part is a mandatory oral examination.

The preliminary examination is comprehensive and not restricted to the content of graduate courses. It is intended to rigorously test the student's knowledge of major, minor, and supporting subject matter. It is also intended to evaluate the student's ability to analyze, organize, and present subject matter relevant to the field of study.

The following conditions must be met before a student is eligible to take the preliminary examination.

1. Full admission status and registered for at least one-credit hour.
2. Approved Recommendation for Committee Appointment Form.
3. Approved Academic Program of Study Form.
4. English requirements met.
5. Not on probation.
6. Time limit for program not exceeded.

Immediately following the preliminary oral examination, the Academic Program of Study committee must decide whether the student will be admitted to candidacy and be permitted to work toward a Ph.D. degree. All members of the committee (or approved substitutes) must be present at the oral examination and sign the report form. The committee has four options:

1. The student passes, and the committee recommends to the Graduate College that the student be admitted to candidacy.

2. The student may continue studies but must meet other conditions specified by the Academic Program of Study committee on the Report of Preliminary Examination Form before being recommended for admission to candidacy.

3. The student fails, but is given an opportunity to repeat the oral examination. A letter of explanation must accompany the report form. The reexamination cannot occur less than six months after the first examination.

4. The student fails and is not permitted to continue work toward the Ph.D. in Horticulture at Iowa State University. A letter of explanation must accompany the report form.

Teaching Experience during the Graduate Degree Program

Many recipients of graduate degrees in horticulture accept positions that involve classroom teaching or other forms of education. Employers look for teaching experience during graduate training.

Hort. 6980 **(Teaching Practicum)** is a 1-credit course and is required for all M.S. and Ph.D. students who begin their degree program Fall Semester 2006 or after.

To be able to acquire real 'classroom' teaching experience, it is advised that you look over our undergraduate and graduate course offerings. You may find a course being taught that is of interest to you. Feel free to discuss your interest in getting involved in the course with your advisor. The instructor probably will welcome your assistance and may be able to suggest innovative ways for you to become involved. Alternatively, your major professor or another member of the faculty may approach you to help with the instruction of their course.

Departmental Seminars

Formal, oral presentations are an essential component of the training program in graduate studies. Each student must be enrolled in Graduate Seminar (Hort 6100 - 1 credit) for one semester for an M.S. student and two semesters for a Ph.D. student. Ideally, these seminars represent a report of the research project of the student. It is strongly recommended that one seminar be a final, exit seminar on the thesis project.

All graduate students are expected to attend all departmental seminars, regardless of enrollment in Hort. 6100.

Final Oral Examinations

For the M.S. degree, questions may be asked concerning both coursework and the thesis or creative component, and other information relevant to the graduate program. The student should spend a few weeks reviewing old course notes, especially of those courses taught by faculty on the Academic Program of Study committee. The student should be prepared to defend the conclusions reached in his/her scholarship, as well as the methodology used to obtain the results.

For the Ph.D. degree, questioning is primarily focused on the dissertation research. The student should expect to be challenged on his/her conclusions, as well as on any aspect of the methodology. Questions about coursework may be asked, especially if the student had trouble with a particular subject during the oral preliminary examination. For most Ph.D. students, the final oral exam represents an opportunity to show the Academic Program of Study committee the results of years of hard work, and this examination can be an enjoyable experience. If the student has trouble justifying some of the conclusions of the research to himself/herself, this may be an indication that more work needs to be done before the final examination is scheduled.

Policies Related to Interdepartmental Majors

Students wishing to study horticultural topics may have the option of participating in one of the interdepartmental programs that are available on campus. Presently, we have faculty who are members of the Interdepartmental Plant Biology Major (IPB), the Interdepartmental Genetics and Genomics Major (IGG), the Genetics, Development and Cell Biology (GDCB), the Sustainable Agriculture Program (SUSAG), and the Ecology and Evolutionary Biology (EEB) program. Students choosing one of these majors must meet the admission requirements and the requirements for degree completion of the interdepartmental major. The student must complete course requirements for their major. Preliminary or qualifying exam policy is established by the interdepartmental majors.

Graduate Student Horticulture Society

In the spring of 1993, graduate students in the Department of Horticulture officially formed the Graduate Student Horticulture Society (GSHS). The purpose of GSHS is to foster an atmosphere of unity and comradery through personal and professional development of horticulture graduate students and to improve the lines of communication between graduate students and the faculty and staff of the Department of Horticulture.

Active membership is open to all students in the graduate horticulture program at Iowa State University, while associate membership is open to all graduate students at Iowa State University. The membership fee for all students is $10 a year. Active and associate members enjoy similar privileges, including voting rights and participation in club activities, but only active members are allowed to hold office. Club meetings are held monthly on a day determined to work for all members during the current semester. Meetings are generally held at mid-day, and lunch is provided.

The GSHS holds an annual fundraiser (plant sale) to provide lunches for meetings, activities, and student scholarships. Possible activities include picnics, get togethers, and professional development day trips. The day trips are coordinated events to horticulture related businesses and institutions within the state of Iowa.

GSHS officers consist of: President, Secretary, Treasurer, Graduate and Professional Student Senate (GPSS) representative, and a Horticulture Faculty Liaison. Offices are held for one year, and new officers are elected by active and associate members in good standing. A copy of the GSHS constitution can be obtained through any of the officers, or at the Iowa State University Student Organizations' webpage.

Professional Societies Related to Horticulture

During your stay as a graduate student in the Department of Horticulture, your major professor or some other person that is a representative of a professional society may approach you to become a member of one or more professional societies. The faculty in the Department of Horticulture would like to encourage you to become a member of at least one professional society. The cost of becoming a member of most professional societies is greatly reduced for graduate students, but the cost escalates when you graduate.

There are several benefits to membership in one or more of the professional societies related to horticulture. First, membership offers you contact with research scientists, teachers, and extension personnel within your profession, and the range of exposure to them is enormous. In addition, meeting with them at the meetings of the society is a distinct possibility. The exchange of ideas and other information with colleagues in the same professional society is an excellent mechanism for staying abreast of new and important developments in your profession. A second benefit is that most professional societies publish one or more journals that contain research results and other pertinent information for members of the society. These journals become a possible avenue for the publication of research results from your thesis or dissertation project, and they may continue to be useful avenues for publication throughout your professional career. A third benefit of society membership is that of a united opinion on controversial issues. The society often polls its membership for responses to an issue that can affect its membership. This united front often carries more weight than individual responses to controversial issues.

There are several societies in which you can participate. You should choose carefully which ones you feel best suit your needs, and then proceed with a membership application. You soon will begin to reap the benefits of society membership, and the benefits will continue to accrue as you move through your professional career. Finally, membership in one or more societies will be helpful when you apply for a permanent position in the future. Employers often will look for activity in one or more professional societies, and this often is used as a marker of cooperation and ability to interact by the applicant.

Discuss professional societies that may be beneficial to you with your major professor, other faculty members, and other graduate students. Getting involved now is likely to enhance your career for years to come.
Following is a partial list of Professional Societies:

- ALCA – Associated Landscape Contractors of America
- American Conifer Society
- American Nursery & Landscape Association

- American Pomological Society
- American Society of Plant Biologists
- American Society for Horticultural Science
- American Society for Viticulture and Enology
- ASP – American Society of Plasticulture
- Association of Professional Landscape Designers
- Ecological Society of America
- International Ornamental Crabapple Society
- International Plant Propagators Society
- International Society for Horticultural Science (ISHS)
- Iowa Specialty Crop Growers Association
- Iowa Grape Growers Association
- Iowa Nursery and Landscape Association
- International Society of Arboriculture (ISA)
- Metropolitan Tree Improvement Alliance
- National Association of Colleges and Teachers of Agriculture
- North American Bramble Growers Association
- North American Strawberry Growers Association
- Perennial Grounds Management Society
- Perennial Plant Association
- Society of Municipal Arborists
- Soil Science Society of America

Making Presentations at Regional & National Meetings

It is the duty of every scientist to disseminate their research results. In addition, your movement up through the ranks during your career will be strongly tied to your ability to communicate to others about your work. Once you have moved through a portion of your research project, or completed it, you will want to disseminate the new information that you have discovered. A major way that research results are disseminated is through presentations at regional or national meetings of a professional society.

There are two primary forms of presentations of research results at meetings. Oral presentations involve the scientist verbally presenting their results to an audience attending the given session. This has been the standard form of communication of research results for many years, but it now is giving way to the other form of presentation, posters. Posters require the scientist to organize and write their results, and then mount the written information on a special board at the meeting. Other researchers will come to the poster, read it, and discuss the results, interpretation, or methodology of the report with the presenting scientist on a one-on-one basis.

Your major professor will help you in the organization and preparation of your presentation. She or he also will direct you to the particular form and societal meeting at which you will present your results. Your major professor and the faculty in the Department of Horticulture strongly encourage you to become a presenter of your research results as soon as you have a unit of work that is appropriate.

Publishing the findings from original research is another avenue to share one's research output. It is strongly expected of both the M.S. and Ph.D. students that they publish one or more articles in peer-reviewed scientific journals pertinent to their research topic. Your major professor will guide you in the organization, preparation and submission of these manuscripts for publication.

Outcomes Assessment: Providing the Department Feedback after Graduation

The graduate program in horticulture is committed to ongoing evaluation to determine our effectiveness and to identify ways to improve.

One of the primary goals of the graduate program in the Department of Horticulture is to ensure graduates possess a broad understanding of the horticulture discipline and related plant sciences. We expect graduates will be able to communicate effectively with fellow scientists, industry professionals, or any other interested party. Experience in conducting original research and disseminating the findings of that research via refereed journals also is expected. Our graduate program is designed to develop and enhance a students' ability to identify, understand, and solve complex problems. Finally, we expect graduates will have a thorough understanding of the ethical, legal, social, and environmental issues confronting the science and practice of horticulture and the related plant sciences.

Program-Integrated Assessment
Methods of assessing our effectiveness in training graduate students are integrated into the courses you complete and the other requirements we have established. Course examinations, writing assignments, and oral presentations are examples. Other tools of assessment include preliminary examinations, final orals, and the seminars you deliver.

Post-Graduation Assessment
Periodically, questionnaires may be sent to all M.S. and Ph.D. recipients. Information on your employment status may be sought. We are particularly interested in how prepared you considered yourself as you began your career. Feedback from graduates also helps us to refine our programs in ways that reflect the ever-changing job market and the emerging technical skills and competencies required of horticultural professionals.

Formal Exit Interviews by the Department Chair
Each finishing graduate student will have the opportunity to meet with the Department Chair. Each semester a group meeting is scheduled so those graduating can provide comments to the Department Chair regarding their experience as a Department of Horticulture graduate student.

Professional Development Activities and Individual Development Plans

Graduate students majoring in horticulture are encouraged to enrich their academic experiences by taking advantage of the many opportunities available for professional development. The Graduate College maintains a list of such opportunities, which are categorized within six core competencies: Career, Communication, Leadership/Management, Research, Teaching, and Wellness. Visit the web site below to see upcoming events. You might consider bookmarking the web site and visiting it several times each semester; the offerings are updated frequently.

http://www.grad-college.iastate.edu/current/professional_development/

The faculty of the horticulture major also encourage its students to create and maintain Individual Development Plans (IDP). According to Federation of American Societies for Experimental Biology (FASEB), the purpose of the IDP is to "provide a planning process that identifies both professional development needs and career objectives. Furthermore, IDPs serve as a communication tool between individuals and their mentors." The purpose of IDP is to build upon your current strengths by identifying areas for development and crafting a plan to address those areas. The IDP will set a course for your graduate program that will match your skills to your career ambitions. You should work with your faculty mentor(s) to agree on an IDP that will allow you to be productive while positioning you to be successful in your chosen career. In most cases, your primary faculty mentor will be your major professor, though you may develop a larger group of colleagues who can promote your professional growth. Because your skills and goals will probably change over time, the IDP will be an evolving document that you will return to with your mentor during your degree program. Please visit the web site below to learn more about creating your IDP.

http://www.grad-college.iastate.edu/current/professional_development/idp/