DEGREE GUIDELINES FOR MS DEGREES IN THE GRADUATE GROUP IN HORTICULTURE AND AGRONOMY

The Graduate Group in Horticulture and Agronomy (GGHA) is organized to offer programs of study in the areas of Agronomy, Environmental Horticulture and Urban Forestry, Pomology, Vegetable Crops, Viticulture, and Weed Science, leading to a Master of Science degree. Students may select a thesis (Plan I) or non-thesis (Plan II) option.

REQUIREMENTS FOR THE MASTER'S DEGREE IN THE GRADUATE GROUP IN HORTICULTURE AND AGRONOMY

PLAN I. Thirty (30) units of upper division and graduate courses and a thesis are required. At least 12 of the 30 units must be in graduate courses in the major field. Courses are selected with the advice and consent of the student's Graduate Adviser and the Major Professor who is Chair of the Thesis Committee, which is nominated by the Graduate Adviser and officially appointed by the Graduate Dean. The thesis will be based on experimental research.

PLAN II. Thirty-six (36) units of upper division and graduate course work and a comprehensive final examination are required. At least 18 of the 36 units must be earned in graduate courses in the major field; no more than 9 of these 18 may be in research (299) courses. The group requires a minimum of 6 units of original research. Courses are selected with the advice and consent of the student's Graduate Adviser. A faculty committee of three (3) is nominated by the Graduate Adviser and appointed by the Graduate Dean to administer the exam.

MINIMUM ADMISSION REQUIREMENTS

Applicants to the GGHA will be evaluated based on the following criteria:
1. Adequate undergraduate preparation (equivalent to a BS in the plant sciences or related subject matter area).
2. GPA of 3.0 (on the basis of the final 2 years).
3. Graduate Record Examination scores in the Verbal, Quantitative and Analytical areas.
4. Three letters of recommendation.
5. TOEFL score of 550 (for international students).

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<thead>
<tr>
<th>Undergraduate Preparation</th>
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<tr>
<td>General chemistry</td>
<td>CHE2A and 2B</td>
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<td>Organic chemistry</td>
<td>CHEBA and 8B</td>
</tr>
<tr>
<td>General biology</td>
<td>BIS1A, 1B and 1C</td>
</tr>
<tr>
<td>Physics</td>
<td>PHY1A and 1B or 7A and 7B</td>
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<tr>
<td>Statistics</td>
<td>ASE120 or STA13</td>
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<tr>
<td>Genetics</td>
<td>BIS101 or PLB152</td>
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<tr>
<td>Plant physiology</td>
<td>PLB111 and 112</td>
</tr>
<tr>
<td>Pests/Diseases</td>
<td>ENT110 or PLP120 or PLB176 or ASE105</td>
</tr>
<tr>
<td>Soils/Plant nutrition</td>
<td>SSC100 or PLB158</td>
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ADMISSION PROCEDURES

1. Applications will be accepted for admission for Fall Quarter.
2. The Graduate Group in Horticulture and Agronomy Admissions Committee will screen applications as they are received to make sure they meet the minimum requirements listed above.
3. If an applicant's undergraduate preparation is deficient by more than 16 units but otherwise meets the minimum requirements, the applicant will be advised to make up these deficiencies before reapplying for admission to the Group.
4. The Admissions Committee will periodically circulate an "Applicant Summary List" to all members of the Group during the Spring admissions cycle. Graduate Advisers will identify and contact appropriate faculty members suited to the student's needs. Copies of applicant's files may be sent to departmental advisers to facilitate review of files by prospective major professors.

5. The Chair of the Admissions Committee will inform Graduate Division of the action taken on each application.

**COURSE REQUIREMENTS**

**Core Courses: 8 units minimum**

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<th>Course Number</th>
<th>Course Name</th>
<th>Units</th>
<th>Quarter</th>
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</thead>
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<tr>
<td>HRT 290</td>
<td>GGHA seminar</td>
<td>1</td>
<td>Fall</td>
</tr>
<tr>
<td>GGG 296</td>
<td>Scientific Professionalism &amp; Integrity</td>
<td>2</td>
<td>Fall</td>
</tr>
<tr>
<td>NUT 492A</td>
<td>Professionalism</td>
<td>2</td>
<td>Fall</td>
</tr>
<tr>
<td>SOC 298</td>
<td>Ethics &amp; Professionalism in the Academy</td>
<td>2</td>
<td>Varies</td>
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One course on ecology, which may include:

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<th>Course Number</th>
<th>Course Name</th>
<th>Units</th>
<th>Quarter</th>
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</thead>
<tbody>
<tr>
<td>PLB 142</td>
<td>Ecology of Crop Systems</td>
<td>4</td>
<td>Winter</td>
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<tr>
<td>EVE/PLB 117</td>
<td>Plant Ecology</td>
<td>4</td>
<td>Fall</td>
</tr>
<tr>
<td>ECL 216</td>
<td>Ecology and Agriculture</td>
<td>3</td>
<td>Fall</td>
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One course on research methods or perspectives, which may include:

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<th>Course Number</th>
<th>Course Name</th>
<th>Units</th>
<th>Quarter</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRT 203</td>
<td>Research Perspectives in Horticulture</td>
<td>3</td>
<td>Fall - Odd Years</td>
</tr>
<tr>
<td>PBI 225</td>
<td>Methods &amp; Instrumentation for Crop and Soil Science</td>
<td>3</td>
<td>Spring - Odd Years</td>
</tr>
<tr>
<td>AGR 205</td>
<td>Experimental Design and Analysis</td>
<td>4</td>
<td>Winter</td>
</tr>
<tr>
<td>AGR 206</td>
<td>Multivariate Systems and Modeling</td>
<td>4</td>
<td>Spring</td>
</tr>
<tr>
<td>ECL 206</td>
<td>Concepts and Methods in Plant Community Ecology</td>
<td>4</td>
<td>Winter</td>
</tr>
<tr>
<td>VEN 200</td>
<td>Introduction to Scientific Methods</td>
<td>2</td>
<td>Spring</td>
</tr>
</tbody>
</table>

**Graduate Seminars:** 3 units  
3 additional seminars, at least one from outside home department

**Research:** 6 units minimum

**Courses for Option:** 8 to 14 units minimum

Students will choose one of the following options in which to focus their remaining course work and research. They must take at least one graduate course from within that option.

Agronomy, Environmental Horticulture, Pomology, Vegetable Crops, Viticulture and Weed Science

Plan I students will select specific courses with guidance from the Graduate Adviser in consultation with the Major Professor. Plan II students will select specific courses in consultation with the Graduate Adviser. Within an option, the student can specialize in one of a number of areas; some specializations are suggested below:

Agroecology, Biotechnology, Breeding and Genetics or Crop Improvement, Crop Physiology, Crop Production, Mineral Nutrition, Modeling and Quantitative Horticulture, Pest Management, Plant Growth and Development, Postharvest Physiology, Revegetation/Restoration, and Water Relations
Suggested courses:

Listed below are courses organized by name. Descriptions of the courses can be found in the General Catalog. Upper division courses are numbered 100-199 and Graduate level courses are numbered 200-299. Note that this list is by no means exhaustive and will change as new courses are offered or others are dropped.

**ABT** (Applied Biological Systems Technology)
- 233 Advanced Pest Control Practices

**AGR** (Agronomy)
- 205 Experimental Design and Analysis
- 206 Multivariate Systems and Modeling
- 221 Advanced Plant Breeding
- 222 Quantitative Genetics and Plant Improvement
- 223 Selection Theory in Plant Breeding
- 224 Chromosome Evolution
- 232 Advanced Topics in the Physiology of Crop and Range Plants
- 234 Physiology of Crop Growth and Development
- 291 Seminar in Plant Breeding and Evolution of Cultivated Plants

**ASE** (Agricultural Systems and Environment)
- 105 Concepts in Pest Management
- 107 Small Fruit Production
- 110A Principles of Agronomic Crop Production in Temperate and Tropical Systems
- 110B Management of Agronomic Crops in Temperate and Tropical Systems
- 110C Crop Management Systems for Vegetable Production
- 110L Principles of Agronomy Laboratory
- 118 Seed Production and Quality
- 121 Systems Analysis in Agriculture and Resource Management
- 170AB Fruit and Nut Cropping Systems

**ENH** (Environmental Horticulture)
- 100 Urban Forestry
- 102 Physiological Principles in Environmental Horticulture
- 120 Management of Container Soils
- 125 Greenhouse and Nursery Crop Production
- 130 Turfgrass and Amenity Grassland Utilization and Management
- 133 Woody Plants in the Landscape: Growth, Ecology and Management
- 220 Tree Biotechnology
- 241 Analysis of Horticultural Problems

**ENT** (Entomology)
- 110 Arthropod Pest Management
- 135 Introduction to Biological Control
- 200B Conceptual Basis of Entomology: Application
- 230 Advanced Biological Control

**EVE** (Evolution and Ecology)
- 201 Ecosystems and Landscape Ecology

**GGG** (Genetics Graduate Group)
- 201A Transmission Genetics
- 201C Molecular Genetics
- 201D Quantitative and Population Genetics

**HRT** (Horticulture)
- 203 Research Perspectives in Horticulture
- 251 Modeling Horticultural Systems

**HYD** (Hydrologic Science)
- 100 Principles of Hydrologic Science
- 110 Irrigation Principles and Practices
- 113 Water Quality, Soil Salinity and Reclamation
- 115 Irrigation and Drainage Systems
- 117 Irrigation Water Management
- 124 Plant-Water-Soil Relationships
- 136 Chemistry of the Hydrosphere
- 200 Survey of Hydrologic Science
- 212 Evapotranspiration
- 245 Advanced Soil Physics

**IAD** (International Agricultural Development)
- 101 Tropical Crop Agriculture
- 200 Analysis and Determinants of Cropping Systems

**LDA** (Landscape Architecture)
- 153 Introduction to Landscape Ecology
- 155 Plants in the Cultural Environment

**MCB** (Molecular and Cellular Biology)
- 126 Plant Biochemistry
- 161 Molecular Genetics
- 163 Developmental Genetics
- 170L Advanced Molecular Genetics Laboratory
- 262 Recombinant DNA and Genetic Engineering

**MGT, MGP** (Management)
- 200A Introduction to Financial Accounting

**NEM** (Nematology)
- 100 General Plant Nematology
- 110 Introduction to Nematology
- 202 Nematodes and the Soil Environment
PLB (Plant Biology - upper division)
102 California Floristics
105 Developmental Plant Anatomy
108 Systematics and Evolution of Angiosperms
111 Plant Physiology
112 Plant Growth and Development
117 Plant Ecology
121 Biology of Weeds
142 Ecology of Crop Systems
143 Evolution of Crop Plants
144 Trees and Forests
146 Rhizosphere Ecology
148 Introduction to Mycology
151 Conservation of Plant Genetic Resources
152 Plant Genetics
153 Plant Cell, Tissue, and Organ Culture
154 Plant Breeding
155 Anatomical and Cytological Methods
157 Physiology of Environmental Stresses in Plants
158 Mineral Nutrition of Plants
160 Principles of Plant Biotechnology
161A,B Plant Genetics and Biotechnology Laboratory
171 Plant Propagation
172 Postharvest Physiology and Handling of Horticultural Commodities
172L Postharvest Physiology and Handling Lab
173 Biological Applications in Pomology
174 Principles of Fruit Production
175 Applied Plant Biology
176 Introduction to Weed Science
177 Action of Herbicides
178 Biology and Management of Fresh Water Macrophytes
196 Postharvest Technology of Horticultural Crops

PBI (Plant Biology - Graduate Level)
201 Plant Senescence: Cellular and Molecular Aspects
202 Advanced Physiology of Cultivated Plants
205ABC Advanced Plant Physiology
206ABC Advanced Plant Physiology Laboratory
208 Plant Hormones and Regulators
210 Plant Ecophysiology
211 Ecophysiological Methods
212 Physiology of Herbicidal Action
216 Advanced Topics in Mineral Nutrition
219 Reproductive Biology of Flowering Plants
222 Special Topics in Plant Morphology, Systematics, and Ecology
223 Special Topics in Scientific Methods
224 Water in Physiology and Ecology of Plants
231 Biological Electron Microscopy
231L Biological Electron Microscopy Laboratory

PLP (Plant Pathology)
120 Introduction to Plant Pathology
125 Diagnosis and Control of Plant Diseases
205AB Diseases of Vegetable and Field Crops
206AB Diseases of Fruit, Nut, and Vine Crops
208 Ecology and Plant Pathogens and Epidemiology of Plant Diseases
209 Principles of Plant Disease Control

PPP (Plant Protection and Pest Management)
201 Concepts and Systems of Plant Protection and Pest Management
202A-202B Diagnosis of Plant Pest Problems and the Control of Causal Agents

POM (Pomology)
210 Plant Reproductive Morphology
212 Postharvest Biology and Biotechnology of Fruits and Nuts
220 Quantitative Genetics and Selection Theory
221 Principles and Practices of Line Cultivar Breeding

SSC (Soil Science)
102 Soil and Water Chemistry
107 Soil Physics
109 Soil Fertility and Fertilizers
120 Soil Genesis, Morphology, and Classification
208 Soil-Plant Interrelationships

VCR (Vegetable Crops)
212 Postharvest Physiology of Vegetables
220 Genomics and Biotechnology of Crop Improvement
221 Genomics and Breeding of Vegetable Crops

VEN (Viticulture and Enology)
101ABC Viticultural Practices
110 Grapevine Growth and Physiology
115 Raisin and Table Grape Production
116 Winegrape Production
118 Grapevine Pests, Diseases and Disorders
210 Grape Development and Composition
216 Vineyard Establishment and Development
PROCEDURES FOR APPOINTING and CHANGING MAJOR PROFESSOR

1. A major professor must be identified for new Plan I students before they can be admitted. Prospective students are encouraged to contact faculty in the Group and they may be contacted by interested faculty. The Master Adviser will also help with the process of arranging major professors for prospective students. Plan II students will be assigned to the appropriate Master Adviser.

2. Each new student will be given a list of group faculty members and their areas of specialization and will be informed that the pre-selected major professor can be changed.

3. Requests for change from either the student or the major professor will be handled by the departmental Graduate Adviser who may seek assistance from the Executive Committee if needed.

ADVISING GUIDELINES

1. Before Fall Quarter begins, the Graduate Adviser in each department will meet with each student to assist in setting up course schedules for the Fall, Winter and Spring Quarters. Both new and continuing students will meet with the Graduate Adviser at this time. See Appendix I for the advising form and Appendix II for the course schedule form.

2. It is the responsibility of the Graduate Adviser to make certain that the student meets Group and specialization requirements and to keep the student's Major Professor apprised of the student's status.

3. Students will be informed about the following requirements:
   a. A final formal report for research (299) units carried by students in Plan II will be submitted to the Comprehensive Exam Committee two weeks before the examination date, so that the research area can help guide the oral exam. A copy of this report will be filed with the Master Adviser and the Group administrative assistant.
   b. Full-time students will enroll for a minimum of 12 units per quarter. Normally no more than 6 enrolled quarters and 2 summers will be allotted to a student to complete the degree requirements.

4. During the Spring quarter, a progress report, signed by each student and the Major Professor, will be filed with the Graduate Adviser and in the department. Unsatisfactory progress reports will be filed with the Graduate Division. Copies will be retained in the student's file.

5. Advancement to candidacy will depend on review of the student's record and qualifications.

APPOINTMENT AND NOMINATION OF THESIS AND COMPREHENSIVE EXAMINATION COMMITTEES

Before the appointment of either a thesis or examining committee, the student and major professor should meet with the Graduate Adviser to suggest a committee for the student.

Thesis Committee (Plan I): A thesis committee of three shall be formed when the student has begun the thesis project. Early appointment of the committee is essential for the student to obtain maximum guidance from the committee. The student should consult with each member to discuss the research not less than once per quarter. The thesis committee will be approved by the Graduate Adviser and officially appointed by the Graduate Dean. The Major Professor will be designated as Chair, and selection of at least one member from outside the department of the student is encouraged. All members of the committee should be in the Graduate Group in Horticulture and Agronomy (GGHA). If someone is selected to be on the thesis committee who is not in the GGHA, a letter justifying the selection and a curriculum vitae of selected person must be sent by the Chair of the thesis committee to the GGHA Executive Committee.

Comprehensive Examination Committee (Plan II): The Master's Comprehensive Examination Committee will be nominated by the Graduate Adviser after consultation with the student, appointed by the Executive Committee of the GGHA and presented to Graduate Studies with the Advancement to Candidacy form at least one quarter prior to the exam. Selection of at least one member from outside the department of the student is encouraged. The oral exam will normally last two hours and cover the student's area(s) of specialization. A form to report the results of the examination will be provided to the Chair of the examination committee (Appendix III). Immediately after the examination, the committee chair will report the results of the examination to the Graduate Group Chair and Graduate Adviser using the form provided. The form will then be forwarded to Graduate Studies. If the student does not pass the exam, he or she will be offered one chance to retake the exam by the end of the next quarter.
ADVISING FORM - HORTICULTURE & AGRONOMY GRADUATE GROUP

STUDENT __________________________ ENTERED _______ PLANNED QTR OF COMPLETION ______

MAJOR PROF _______ OPTION __________________ SPECIALIZATION __________________

☐ PLAN I THESIS COMMITTEE _______________ _______________ _______________

Date Thesis Filed _______________

☐ PLAN II EXAM COMMITTEE _______________ _______________ _______________

Date Exam Scheduled _______________

UNDERGRADUATE PREPARATION

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<th>Subject</th>
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<tbody>
<tr>
<td>General Biology</td>
<td>BIS 1A, 1B, 1C</td>
<td>Plant Physiology</td>
<td>PLB 111 and 112</td>
</tr>
<tr>
<td>General Chemistry</td>
<td>CHE 2A, 2B</td>
<td>Genetics</td>
<td>PLB 152 or BIS 101</td>
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<tr>
<td>Organic Chemistry</td>
<td>CHE 8A, 8B</td>
<td>Soils/Plant Nutrition</td>
<td>SSC 100 or PLB 158</td>
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<tr>
<td>General Physics</td>
<td>PHY 1A, 1B</td>
<td>Pest/Diseases</td>
<td>ENT 110 or PLP 120 or</td>
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<tr>
<td>Statistics</td>
<td>STA 13 or ASE 120</td>
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<td>PLB 176 or ASE 105</td>
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MS REQUIREMENTS

Core Courses:

_____ HRT 290 - GGHA Seminar (1 unit) Fall

One course on ecology:

_____ PLB 142 - Ecology of Crop Systems (4 units) Winter

_____ EVE/PLB 117 - Plant Ecology (4 units) Fall

_____ ECL 216 - Ecology and Agriculture (3 units) Fall

One course on professionalism and ethics:

_____ GGG 296 - Scientific Professionalism & Integrity (2 units) Fall

_____ NUT 492A - Professionalism (2 units) Fall

_____ SOC 298 - Ethics & Professionalism in the Academy (2 units) Varies

One course on research methods or perspectives:

_____ HRT 203 - Research Perspectives in Horticulture (3 units) Fall - Odd Years

_____ PBI 226 - Methods & Instrumentation for Crop and Soil Science (3 units) Spring - Odd Years

_____ AGR 205 - Experimental Design and Analysis (4 units) Winter

_____ AGR 206 - Multivariate Systems and Modeling (4 units) Spring

_____ VEN 200 - Introduction to Scientific Methods (2 units) Spring

Graduate Seminars: (3 additional seminars, at least one from outside home department)

_________________________________ _______________________________________

Courses for Option: (Student must take at least one graduate course from within option)

_________________________________ _______________________________________

TOTALS: Upper Division Units

299 Units (Plan II only: 6 units min, 9 units max) ______

Overall Graduate Level Units

(mins: Plan I - 12 units; Plan II - 18 units) TOTAL ______
# COURSE SCHEDULE: THE GRADUATE GROUP IN HORTICULTURE AND AGRONOMY

**STUDENT** ______________________________ ENTERED ________________

**DEPARTMENT** __________________________ MAJOR PROF ________________

**ADVISER** ______________________________

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**Notes:**
APPENDIX III

REPORT - COMPREHENSIVE EXAMINATION, PLAN II
MS DEGREE IN HORTICULTURE & AGRONOMY

Date: __________________________

To: __________________________

From: _______________________________________
       Chairperson, M.S. Examination Committee

Subject: Results of Comprehensive Examination, Plan II,
M.S. Degree in Horticulture & Agronomy

_________________________ has passed / not passed / failed the Comprehensive Examination for the
M.S. Degree in Horticulture & Agronomy conducted on ____________. The following members were
present at the examination:

1. ____________________________

2. ____________________________

3. ____________________________
   (PRINT NAME)                (SIGNATURE)

COMMENTS: