Directions: Please complete this graduate student learning outcomes assessment plan for each Master’s program with the distinct learning outcomes in your unit. Be concise, but provide as much information as needed to give a snapshot of your assessment plan/process. If you have this information in another format that articulates the following, please feel free to attach that document and refer to it as appropriate in the boxes below. If you have questions, please contact Gita at 7-2180.

1. Program Information:

<table>
<thead>
<tr>
<th>Program</th>
<th>Masters of Science</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department</td>
<td>Horticulture</td>
</tr>
<tr>
<td>College</td>
<td>College of Agriculture</td>
</tr>
<tr>
<td>Report Submitted by</td>
<td>John Lambrinos and Anita Azarenko</td>
</tr>
</tbody>
</table>

2. Program Outcomes

Provide the Graduate Learning Objectives/Outcomes for your PhD program.

Through successful participation and completion of a Master of Science, Horticulture degree program, students will gain an advanced understanding of horticultural sciences and its relationship to other disciplines. Students will be sufficiently trained through disciplinary coursework and research experience to provide horticulture expertise and will have the breadth of knowledge to be able to communicate with professionals from the broad range of specialties involved in horticultural systems management and research.

Outcome 1: SCHOLARSHIP
Graduates will have the ability to conduct research that extends knowledge in the field of horticulture. This will be demonstrated through mastery and application of critical thinking in the design and conduct of research, and application of standard and innovative theory and methods in both coursework and an individual thesis research project.

Outcome 2: KNOWLEDGE
Graduates will be able to demonstrate:
- In-depth disciplinary knowledge and capacity to apply that knowledge to horticultural systems issues at multiple scales and levels of biological organization.
- Demonstrated skill in integrating horticultural systems concepts across multiple disciplines.
The ability to employ technical knowledge and leadership skills to a horticultural research problem.

Learning outcomes specific to horticulture students:

- Ability to perform basic analyses in horticulture and associated sciences.
- Ability to perform other basic tasks required of a professional horticultural scientist.
- Understand key linkages and interactions between horticulture and other biological and earth science processes.

These outcomes will be accomplished through successful completion of the coursework required for the degree and a thesis research project.

Outcome 3: COMMUNICATION
Graduates will have the ability to communicate professionally and with the public about horticulture research and resources. They will gain skills and experience in communicating in both formal and informal venues with learners, practitioners and community members. This will be demonstrated through presentation of a public thesis seminar and public non-thesis seminar.

Outcome 4: ETHICS AND DIVERSITY
Graduates will have a commitment to diversity and high ethical standards in scholarship, teaching and service. This will occur through participation and training in research methods courses, professional development courses, and seminars, workshops, or other activities focused on diversity and ethics.
3. **Measurement** – Provide a detailed narrative or schematic to articulate how all the outcomes will be measured.

<table>
<thead>
<tr>
<th>a) Describe the methods you will use to assess each outcome.</th>
</tr>
</thead>
</table>

**Outcome 1: SCHOLARSHIP**

Students will conduct an independent research project with oversight by a major advisor. When the research project is completed, the thesis is examined along with an oral defense so that faculty can assess the qualifications of the student as an independent scholar and successful communicator. The “Scoring Guide for Graduate Learning Outcomes Assessment” will be used at each oral defense (see attachment #1). Success rates of defenses and documentation of deficiencies that delay or inhibit successful completion of the Horticulture degree are noted and reviewed on an annual basis by the Horticulture Graduate Program Director.

**Outcome 2: KNOWLEDGE**

Performance in core and discipline-specific courses reveals the level of fundamental knowledge, communication skills, and ability to synthesize. Students in the Horticulture Graduate program must maintain a 3.00 GPA in all coursework. Any term that the GPA falls below this average, the student will meet with the major advisor and the Horticulture Graduate Program Director to develop an educational plan for addressing difficulties. The student will have one term to raise the GPA to appropriate levels or will face termination from the program. The student’s Major Professor will track information about classes taken by students, grades and educational plans.

**Outcome 3: COMMUNICATION**

Students will be encouraged, supported, and provided the opportunity to design and communicate in both formal (teaching and professional meetings) and informal settings (community and professional education). If applicable, supervising instructors will provide GTA reviews and learner evaluations. At professional meetings or seminars, students will be observed by Horticulture faculty members and peers, and as appropriate, from the organization that is sponsoring the professional or community education. All observations will be shared with the student and with the Horticulture Graduate Program Director.

**Outcome 4: ETHICS AND DIVERSITY**

Students are expected to demonstrate a commitment to diversity and high ethical standards throughout their coursework, research and teaching assignments.

**PROGRAM OUTCOMES:**

With the assistance of the Department administrative assistant, the Horticulture Graduate Program Director and Department Head will track information about the program including:

a. The number of applicants, offers, and acceptances on a yearly basis
b. Information about students’ background qualifications (e.g., undergrad/grad degrees, schools attended,
GPA, GRE scores, etc.) will be collected and reviewed on a yearly basis
b. An annual student assessment of progress and achievement
d. Retention and graduation rates
e. Graduate exit interview
f. Track post-graduation employment success

b) Describe and attach any measurement tools to be used (exam results, performance criteria, evaluation/performance rubrics, etc.,)
The Director of the Horticulture Graduate Program with assistance from the administrative assistant will collect and maintain information listed as described in (a) above. This includes but is not limited to the "Scoring Guide for Graduate Learning Outcomes Assessment” Attachment #1), and the “Mapping Guide for the MS Degree –Horticulture Graduate Program” (Attachment #2). These guides will be made available to each student at the beginning of their tenure in the Horticulture degree program.

4. Please provide a skeletal assessment plan (Mapping Guide) for your program:
Provide a skeleton plan describing the specific activities and assessment method for each outcome. Map all required courses (with their learning outcomes) and assessments to the program outcomes.

See attachment #2 as well as this narrative.

Outcome 1 and 2: SCHOLARSHIP AND KNOWLEDGE
Coursework will consist of a minimum of 45 credit hours. In consultation with a major professor, a program of study will be developed to develop competence in horticulture, serve the interests and needs of the student and be relevant to the research project leading to a thesis. Most course programs will include courses from other departments.

Outcome 3: COMMUNICATION
Communication skills will be developed through participation in optional university teaching assignments, presentations at professional conferences, and educational courses and seminars throughout the entire program.

Outcome 4: ETHICS AND DIVERSITY
Commitment to diversity and high ethical standards in horticulture scholarship (research), learning, teaching and engagement (service) will be accomplished through participation and training in research methods courses, professional development seminars, workshops and/or seminars focused on diversity and ethics, and core courses.

5. **Other activities that have informed decision making**:

Please report on any other activities that you feel fall under assessment that were not captured above. This may include general satisfaction surveys, employer input, or other initiatives that contribute to student learning or program improvement.

Other activities that fall under assessment, but not captured above, may include general satisfaction surveys, employer input, or other initiatives that contribute to student learning or program improvement.
ATTACHMENT 1: Scoring Guide (Rubric) for Graduate Learning Outcome Assessment

MS DEFENSE EXAM* in Horticulture

Candidate Name: ___________________________ Date: ________________
Title of Thesis: ____________________________________________________________________________________

<table>
<thead>
<tr>
<th>Evaluation/Guidance</th>
<th>Does not meet Expectations</th>
<th>Meets Expectations</th>
<th>Exemplary Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Problem Definition: Has stated the research problem clearly, providing motivation for undertaking the research</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Literature and Previous Work: Demonstrated sound knowledge of literature in the area, and of prior work on the specific research problem</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>3. Impact of Research: Demonstrated the potential value of solution to the research problem in advancing knowledge within the area of study</td>
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<tr>
<td>4. Solution Approach: Has applied sound state-of-the-art research methods/tools to solve the defined problem and has described the methods/tools effectively</td>
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<tr>
<td>5. Results: Analyzed and interpreted research results/data effectively</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Quality of Written Communication: Communicates research results clearly and professionally in written form</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Quality of Oral Communication: Communicates research results clearly and professionally in oral form</td>
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<tr>
<td>8. Critical Thinking: Has demonstrated capability for independent research in the area of study and expertise in the area</td>
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<tr>
<td>9. Broader Impact: Demonstrated awareness of broader implications of the concluded research. Broader implications may include social, economic, technical, ethical, business, etc. aspects.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>10. Publications: Journal or conference publications have resulted (or are anticipated) from this research</td>
<td></td>
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</tbody>
</table>

Overall Assessment: The assessment of the overall performance of the candidate based on the evidence provided in items 1 – 10 above.
### CRITERIA PERFORMANCE RATINGS for THESIS EXAM

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>PERFORMANCE RATINGS for THESIS EXAM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><em>Does NOT PASS Exam</em></td>
</tr>
<tr>
<td>OVERALL, My rating of the Thesis indicates that it:</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Does not meet expectations</em></td>
</tr>
<tr>
<td></td>
<td><em>Exemplary performance</em></td>
</tr>
</tbody>
</table>

Name of the Examining Committee Member: _________________________________
Signature of the Examining Committee Member: _________________________________

*Examiner: Please use the reverse side of this form for written commentary as needed.*

* Note that this form may be used for both THESIS and NON-THESIS MS Defense exams.
Only the top 5 activities are listed for each outcome. Other activities may also support the outcomes, however data will be collected for those listed in each column.

<table>
<thead>
<tr>
<th>Learning Outcomes: Graduate students in the PhD program will demonstrate</th>
<th>Outcome 1: Knowledge and Scholarship</th>
<th>Outcome 2: Communication</th>
<th>Outcome 3: Critical Thinking and Problem Solving</th>
<th>Outcome 4: Ethical Conduct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activities and Evidence:</td>
<td>Identify and conduct original research, scholarship or creative endeavors</td>
<td>Effectively communicate their field of study</td>
<td>Think critically, creatively and solve problems in their field of study</td>
<td>Conduct research in an ethical and responsible manner</td>
</tr>
</tbody>
</table>

1. **Presentation of Research at Seminars and Other Appropriate Venues**
   - Demonstrate capacity for critical analysis and peer review in core courses and research.
   - Demonstrate ability to communicate research at professional society meetings, departmental seminar and deliver educational efforts to appropriate audiences.
   - Participate in discussions on diversity and responsible conduct of research, teaching, and service.
   - Read OSU websites that provide information on ethical conduct of research.
   - Identify an appropriate code of ethics for your profession and be prepared to follow it.

2. **Plan of Study Coursework**
   - Gain knowledge to apply to related scholarship in thesis research.
   - Gain disciplinary knowledge relevant to the student’s area of concentration and thesis research.
   - Gain knowledge related to communicating in formal and informal venues.
   - Gain knowledge related to audience appropriate and ethical scholarship, learning, and engagement.

3. **Research credits**
   - Earn a Satisfactory in 12 thesis credits.
### 3. MS Thesis
#### Publish this Scholarship in Appropriate Outlets

| Prepare a thesis that meets expectations for independent scholarly work. Plan to submit manuscripts for publication in the peer-reviewed literature. | Prepare a thesis that demonstrates critical thinking and creativity. | Make sure that notice of your completed work is shared with appropriate audiences (direct them to Scholar’s Archive at a minimum). Plan submission for publication research, extension, or teaching results in peer-reviewed and/or other outlets that are audience appropriate. | Prepare a thesis based on ethical and responsible scholarly work that is appropriate for the target audience(s). Make sure that whatever is published is appropriate and ethical. |

### 4. MS Oral Defense

| Present the thesis in a public seminar (as required). | Defend the thesis in the exam following the public seminar presentation and demonstrate knowledge competency as part of the oral exam. | Defend the thesis and coursework regimen before the student’s Advisory Committee. | Present the thesis in a public seminar and defend the body of work before the student’s Advisory Committee. |