

## **Graduate Student Learning Outcomes**

Upon completion of a graduate degree, students in BSPM should be able to demonstrate proficiency in each of the following learning outcomes:

### **1. Breadth and depth of knowledge in your area of expertise (a.k.a. technical competencies):**

Demonstrate the ability to explain all levels of biological organization, including molecular, cellular, organismal, and systems (ranging from population, community, and ecosystems) and be able to explain how evolution is the central unifying concept in the biological sciences.

- a) demonstrate expertise in one's discipline (e.g., entomology, plant pathology, weed science) and how it intersects with other, related disciplines.
- b) utilize appropriate experimental designs and methodologies and demonstrate adequate technical skills to test hypotheses
- c) describe the evolutionary importance of genetic variation (including that arising from natural selection, mutation, and genetic drift) in terms of how genetic diversity contributes to local adaptation, speciation, and biodiversity within your area of specialization.
- d) Evaluate results of experiments using statistical and data analysis approaches commonly used in one's area of specialization

### **2. Agricultural literacy:**

Demonstrate an understanding of the social, economic, biological, and physical aspects of the management of biological problems in natural and managed ecosystems.

- a) develop coherent, objective arguments regarding contemporary issues in agricultural and natural (eco)systems.
- b) explain how your field of research can contribute to the resolution of relevant environmental and social issues.

### **3. Critical thinking:**

Describe, apply, analyze, synthesize and evaluate knowledge to develop solutions for problems involving pest and beneficial species in natural and managed ecosystems.

- a) identify knowledge gaps within your specialty and design hypotheses.
- b) design and execute experiments to address knowledge gaps in one's discipline.
- c) Internalize the value of both observational and hypothesis-driven research

### **4. Leadership and Professionalism:**

Develop professional and leadership skills to succeed in future careers.

- a) organize and work effectively within diverse teams to solve complex problems and achieve desired outcomes in natural and managed ecosystems.
- b) manage one's time effectively, work independently, take initiative, and collaborate with colleagues on group research projects.
- c) apply professional standards of science and responsible conduct of scientists that are essential for the pursuit of knowledge. This includes ethics, cultural literacy, social justice, and equity as well as developing a strong awareness of how to appropriately

deal with issues such as plagiarism, bullying, sexual harassment and other Title IX related issues.

### **5. Communication:**

Develop professional communication skills suitable for diverse audiences, with an emphasis on sharing scientific results in written, oral, and graphical forms.

- a) author scientific manuscripts suitable for publication in peer-reviewed scientific journals.
- b) describe your research in presentations at regional, national, and/or international meetings of scientific societies.
- c) write and submit competitive grant proposals.
- d) Develop materials to engage the public (including fellow scientists, industry and government personnel, the general public) in the identification of pest management needs and solutions.

### **6. Mentoring and Teaching (especially for those students who have the opportunity to be teaching assistants):**

Integrate classroom knowledge and laboratory experience to train students and mentees.

- a) apply appropriate pedagogical resources (including appropriate technology) to teach and/or mentor others based on their respective needs.
- b) evaluate your own teaching and mentoring effectiveness and assemble supporting documentation.
- c) create syllabi, lesson plans, and curricula that address learning outcomes relevant to pest and beneficial species in natural and managed ecosystems (for GTA).
- d) create an Individual Development Plan and use this as a mentor and as a mentee
- e) prioritizes mentee and project goals and achieves equitable outcomes