SOIL SCIENCE

Learning Outcomes

Master of Science (M.S.)

1. **KNOW:** Graduates in these three masters programs will have obtained knowledge of core theories and methods as demonstrated by courses completed and grades earned at the bachelor's level. Graduates will exhibit breadth and depth of understanding in their respective disciplines in courses completed at the master's level.
2. **APPLY/CREATE:** Graduates in these three masters programs will be able to clearly synthesize literature and theories in their disciplinary areas and/or in their specialized thesis topics. Such synthesis will help generate new ideas or methods to develop unique solutions to the problems in the three disciplinary programs.
3. **COMMUNICATE:** Graduates in these three masters programs will effectively communicate ideas, arguments, and rationales in clear, concise, well-organized publications (abstracts, papers, proposals) and presentations (conferences, seminars, and research meetings) .
4. **THINK:** Graduates in these three masters programs will be able to critically analyze the work of others in their field of specialty. Such analyses will help graduate students to demonstrate proficiency in designing a research strategy to answer important questions and to improve their own work.
5. **PROF. PRACTICE:** Graduates in these three masters programs will demonstrate the highest ethical standards and core values (including Penn State Core Values) within their discipline and other diverse scientific backgrounds.

Doctor of Philosophy (Ph.D.)

1. **KNOW:** Graduates in these three doctoral programs will have obtained the knowledge of the core theories and methods at the bachelors and/or master's levels. Graduates will exhibit breadth and depth of understanding in their respective disciplines in courses completed at the doctoral level.
2. **APPLY/CREATE:** Graduates in these three doctoral programs will be able to clearly synthesize literature and theories in their disciplinary areas and/or in their specialized thesis/dissertation topics. Such synthesis will help generate new ideas or methods to develop unique solutions to the problems in the three disciplinary doctoral programs.
3. **COMMUNICATE:** Graduates in these three doctoral programs will effectively communicate ideas, arguments, and rationales in clear, concise, well-organized publications (abstracts, papers, proposals) and presentations (conferences, seminars, and research meetings).
4. **THINK:** Graduates in these three doctoral programs will be able to critically analyze the work of others in their field of specialty. Such analyses will help graduate students to demonstrate proficiency in designing a research strategy to answer important questions and to improve their own work.
5. **PROF. PRACTICE:** Graduate students in these three doctoral programs will demonstrate the highest ethical standards and core values (including Penn State Core Values) within their discipline and other diverse scientific backgrounds.