Rubric for PhD defense for Department of Entomology, Penn State

Form to be completed by the student's doctoral committee, as appropriate, and given to the department's Graduate Studies Committee administrative support staff. See page 3 for details on each criterion.

Short-form criteria (see page 3 for more details):

Criterion 1 (Know): Demonstrated in-depth knowledge of the core facts, theories, and methods.

Criterion 2 (Create): Creatively synthesized facts, theories, methods, and current literature to generate new ideas or hypotheses.

Criterion 3 (Apply): Applied knowledge to use and/or develop appropriate methodology, experimental design, and data analyses.

Criterion 4 (Think critically): Independently and critically analyzed and understood details of entomological research conducted by others.

Criterion 5 (Communicate): Conveyed ideas or arguments in a clear, concise, well-organized thesis, and in a formal, oral presentation.

Note: in the table below P=Poor; F=Fair; G=Good; V=Very Good; E=Excellent

Faculty name (*print above, sign below)*	Criterion 1 (Know)					Criterion 2 (Create)					Criterion 3 (Apply)					Criterion 4 (Crit. Think.)					Criterion 5 (Commun.)				
Evaluation:	P	F	G	V	E	P	F	G	V	E	P	F	G	V	E	P	F	G	V	E	P	F	G	V	E

Pass / fail **(circle one)**

Rubric for PhD defense for Department of Entomology, Penn State

Provide brief comments characterizing the student's performance; additional comments or recommendations are necessary for any criterion that received a score of Poor or Fair:

Rubric for PhD defense for Department of Entomology, Penn State

Rubric. *Poor*, *Good*, *Excellent* levels for each criterion (Criteria for *Fair* and *Very Good* are not defined, but are intermediate between their adjacent levels and offer more flexibility in our assessments):

Know: Students will demonstrate in-depth knowledge of core facts, theories, and methods within one or more sub-specialties in entomology or another field as appropriate. Demonstrations will include leading discussions, identifying knowledge gaps, and applying this knowledge in at least one sub-specialty of entomology or other field to solve research questions with relevant details of insect systematics, natural history, physiology, and statistics (if appropriate).

Poor: Student lacks some critical background necessary to understand the context, concepts and/or techniques required for their dissertation project(s) and/or does not demonstrate intellectual mastery.

Good: Student demonstrates comprehensive knowledge of the context and questions driving their dissertation projects and demonstrates intellectual mastery of the concepts and techniques required to complete the proposed research. Depending on the project, the student may need to integrate knowledge from several areas of entomology or other relevant areas of concentration such as statistics.

Excellent: Student will additionally demonstrate comprehensive knowledge of their major concentration area within entomology beyond the context of their own project. For example, the student may identify the fundamental questions in the field or demonstrate the knowledge or ability to identify new opportunistic research directions that could arise from their project.

Create: Graduates will be able to creatively synthesize facts, theories, methods, and current literature to generate new ideas or hypotheses that lead to novel solutions to entomological problems and fundamental entomological questions.

Poor: The proposed research does not clearly demonstrate the potential to generate original publishable work and/or the student does not appear to have the ability to generate such works. Publication would require a faculty member to pull the project together independently of the student.

Good: Proposed project has the potential to generate original publishable work, but demonstrates an intermediate ability, meaning that faculty input will be critical to publication.

Excellent: Student demonstrates the ability to complete creative works independently or take the lead role in publication of their creative works.

Apply: Graduates will apply their knowledge to use and/or develop appropriate methodology, experimental design, and data analyses to conduct independent, responsible and original research studies to address novel questions and/or complex challenges in the field of entomology.

Poor: Research does not apply knowledge and methodologies well and is unlikely to significantly answer or address a novel question/challenge.

Good: Proposed research appropriately applies knowledge and methodologies to try to solve questions or challenges

Excellent: Research applies knowledge and methodologies very well and holds great potential to provide important detail on a key question/challenge.

Think critically: Graduates will be able to independently and critically analyze and understand details of entomological research by others, including the appropriateness of the research techniques, statistical analyses, research results, and the broader implications of research outputs.

Poor: Research will provide only incremental advances, overlooks key previous research, and is not particularly novel. Broader implications are unclear or undefined.

Good: Proposed research logically builds on previous research to develop data that can provide insight on a key question/challenge. Broader implications of research are clear.

Excellent: Research is innovative, provides a unique perspective, and has potential to be transformative. Broader implications are clear and offer substantial benefits.

Communication: Graduates will be able to convey ideas or arguments in clear, concise, well-organized papers and proposals, and in formal, oral presentations.

Poor: Student does not demonstrate the ability to effectively present their ideas in writing/speaking. There may be major organizational or stylistic problems that make the proposal/presentation difficult to understand. Important scientific terms may be misused. Student struggles to explain concepts or answer questions.

Good: Students demonstrate an intermediate ability in written/oral communication of scientific ideas. The student is able, in most cases, to write/speak effectively about their research and communicate their ideas. Students will properly use scientific terms.

Excellent: Student writes/speaks at the level expected for finished products in the field. The student is ready to take the lead role in writing publications or scientific presentations describing the student's experimental results. The student may show the ability to communicate concepts to both experts in the field and lay scientists.