Learning Outcomes

**Master of Education (M.Ed.)**
1. Graduates shall demonstrate advanced knowledge and understanding in several areas of physics core knowledge, and advanced knowledge of education theory and/or practice.
2. Graduates shall demonstrate, at a level appropriate to a departmental colloquium, (i) knowledge of several outstanding problems or questions in diverse sub-fields of physics, (ii) the experimental, observational, or theoretical origins of these problems, and (iii) the principal efforts proposed or underway to address them.
3. Graduates shall demonstrate the ability to communicate professionally, in written and oral form, physics and education research work and conclusions to expert and non-expert audiences.
4. Graduates shall demonstrate (i) knowledge and understanding of professional standards of ethics and conduct, (ii) the ability to analyze situations to identify the standards that should apply and (iii) describe how they may be appropriately acted upon.
5. Graduates shall have a specialty area within the broad domain of physics, within which they shall demonstrate (i) advanced knowledge and understanding of the primary literature, (ii) the ability to analyze and judge new contributions to the primary literature, (iii) the ability to apply disciplinary knowledge and methodologies to understand and explore complex problems within the specialty area.

**Master of Science (M.S.)**
1. Graduates shall demonstrate advanced knowledge and understanding in physics core knowledge (statistical mechanics, theoretical mechanics, classical electrodynamics, and quantum physics) and experimental, observational, and theoretical methodologies, that underpin the practice of modern physics.
2. Graduates shall demonstrate, at a level appropriate to a departmental colloquium, (i) knowledge of several outstanding problems or questions in diverse sub-fields of physics, (ii) the experimental, observational, or theoretical origins of these problems, and (iii) the principal efforts proposed or underway to address them.
3. Graduates shall demonstrate the ability to communicate professionally in written and oral form, physics and education research work and conclusions to physics sub-field expert and non-expert audiences.
4. Graduates shall demonstrate (i) knowledge and understanding of professional standards of ethics and conduct, (ii) the ability to analyze situations to identify the standards that should apply and (iii) describe how they may be appropriately acted upon.
5. Graduates shall have a specialty area within the broad domain of physics, within which they shall demonstrate (i) advanced knowledge and understanding of the primary literature, (ii) the ability to analyze and judge new contributions to the primary literature, (iii) the ability to pose complex research problem(s) and identify the knowledge and methodologies required to address them, and (iv) the ability to apply that knowledge and those methodologies to create new knowledge and/or develop new experimental techniques that advance (or show the potential to advance) knowledge and understanding within the specialty area.

**Doctor of Philosophy (Ph.D.)**
1. Graduates shall demonstrate advanced knowledge and understanding in physics core knowledge (statistical mechanics, theoretical mechanics, classical electrodynamics, and quantum physics) and experimental, observational, and theoretical methodologies, that underpin the practice of modern physics.
2. Graduates shall demonstrate, at a level appropriate to a departmental colloquium, (i) knowledge of several outstanding problems or questions in diverse sub-fields of physics, (ii) the experimental, observational, or theoretical origins of these problems, and (iii) the principal efforts proposed or underway to address them.
3. Graduates shall demonstrate the ability to communicate professionally, in written and oral form, research work and conclusions to physics sub-field expert and non-expert audiences.
4. Graduates shall demonstrate (i) knowledge and understanding of professional standards of ethics and conduct, (ii) the ability to analyze situations to identify the standards that should apply and (iii) describe how they may be appropriately acted upon.
5. Graduates shall have a specialty area within the broad domain of physics, within which they shall demonstrate (i) advanced knowledge and understanding of the primary literature, (ii) the ability to analyze and judge new contributions to the primary literature, (iii) the ability to pose complex research problem(s) and identify the knowledge and methodologies required to address them, and (iv) the ability to apply that knowledge and those methodologies to create new knowledge and/or develop new experimental techniques that advance (or show the potential to advance) knowledge and understanding within the specialty area.