



College of Public Health
University of Nebraska Medical Center

**Doctor of Philosophy in Environmental Health, Occupational Health, and Toxicology
Program Competencies**

Upon graduation, a student with a Doctor of Philosophy in Environmental Health, Occupational Health, and Toxicology should be able to...

1. Synthesize, organize, and present, both orally and in writing, a broad range of qualitative and quantitative information and analyses of environmental, occupational, and toxicology topics, issues, and research to academic, professional, and public audiences.
2. Develop and conduct original research in environmental health, occupational health, and toxicology leading to advancing the field in methodology and field-driven concepts.
3. Use and manipulate knowledge obtained from the scientific literature, germane to the field of interest, to write competitive grant proposals.
4. Demonstrate knowledge, sensitivity, and skill in communicating and working with diverse communities, populations, and cultures on critical environmental, occupational, and toxicology problems and solutions.
5. Develop plans to investigate health issues and implement policies and programs to mitigate public health risks.
6. Identify, assess, control, and prevent various environmental and occupational hazards that are significant risks to human health and safety.
7. Formulate hypotheses, and design experiments to test such hypotheses, aimed at advancing the body of knowledge surrounding environmental, occupational, and toxicology issues.
8. Foster collaboration and cooperation among various stakeholders, interest groups, and populations to raise awareness and achieve environmental, occupational, and toxicology objectives and benefits.
9. Synthesize and leverage economic, cultural, political, and social factors for the creation, development, and successful implementation of environmental, occupational, and toxicology initiatives.
10. Understand risk analysis, assessment, communication, and management.
11. Understand the complex relationship between what is ethical and what is legal in the realm of environmental, occupational, and toxicology research, and appropriately use this knowledge as a scientist and professional.



Doctor of Philosophy in Environmental Health, Occupational Health, and Toxicology Environmental and Occupational Hygiene Track Competencies

Upon graduation, a student with a Doctor of Philosophy in Environmental Health, Occupational Health, and Toxicology, in the Environmental and Occupational Hygiene track, should be able to...

1. Describe characteristics and trends in US agriculture.
2. Utilize available data on agricultural production and populations.
3. Describe common injury and illness hazards in agriculture.
4. Utilize available data resources on agricultural and environmental injuries and illnesses.
5. Describe common intervention strategies and how they apply to agriculture and the environment.
6. Evaluate agricultural safety programs and their strengths and weaknesses.
7. Discuss future strategies to reduce agricultural injuries.
8. Understand a broad range of environmental science health factors that affect the health of a community, including the biological effects of these exposures.
9. Understand methods of risk assessment and control.
10. Understand how public health policy helps control risk.
11. Understand how effective risk communication strategies and techniques contribute to solutions to environmental health problems.
12. Review current literature and formulate research questions.

August 2010



Doctor of Philosophy in Environmental Health, Occupational Health, and Toxicology Occupational Biomechanics Track Competencies

Upon graduation, a student with a Doctor of Philosophy in Environmental Health, Occupational Health, and Toxicology, in the Occupational Biomechanics track, should be able to...

1. Develop basic skills necessary to apply the principles of biomechanical analysis to common work tasks.
2. Apply basic anatomical and mechanical principles to the description and analysis of human movement in common work tasks.
3. Evaluate biomechanical data of an individual and describe the motion of the human body in common work tasks.
4. Understand the systems of instrumentation used in occupational biomechanical research and learn techniques to measure movement and to analyze forces, work, and power in a working environment.
5. Appreciate the need for occupational biomechanics and its limitations in the analysis of standards for manual materials handling.
6. Comprehend the biomechanical principles necessary for understanding current models and guidelines used in occupational ergonomics.
7. Appreciate the need for future research in the development of new models and ergonomic guidelines.
8. Increase ability to better analyze and evaluate performance and make corrections in occupational settings to avoid injury and improve performance.
9. Discuss the origins of motor-control studies.
10. Apply appropriate theories to describe and analyze human movement, with emphasis on variability of human movement, the acquisition of motor skills, and external factors that can affect motor performance.
11. Apply appropriate experimental and clinical tools and procedures to assess motor control.
12. Understand how the nervous system is associated with motor control and its functions.
13. Understand how attentional processes can influence motor performance.

August 2010



Doctor of Philosophy in Environmental Health, Occupational Health, and Toxicology Toxicology Track Competencies

Upon graduation, a student with a Doctor of Philosophy in Environmental Health, Occupational Health, and Toxicology, in the Toxicology track, should be able to...

1. Recognize a chemically induced toxic response.
2. Utilize dose-response characteristics to associate a toxic response to a specific chemical exposure.
3. Use the principles of absorption and distribution to predict the severity of a toxic response to a particular toxicant.
4. Correlate targeted organ toxicity with a specific toxicant exposure.
5. Understand the use of epidemiological data and risk assessment protocols in the prediction of human toxic responses to environmental and workplace exposures.
6. Describe the process of development of government regulatory policies and their impact on industries and on human health.
7. Critically assess the literature on a specific chemical-induced toxicity and use literature resources to compose a critical assessment of a specific toxic response to a chemical toxicant.
8. Present an assessment of toxicity in both oral and written formats.
9. Propose areas of need in the study of specific toxicant-induced responses.
10. Propose approaches to determine the association and/or correlation of a toxic response to a specific chemical exposure.

August 2010