

**University of South Florida, College of Public Health  
Department of Epidemiology and Biostatistics**

**PhD: Epidemiology**

In addition to the overall **Doctor of Philosophy** degree competencies, graduates with a concentration in Epidemiology will be able to:

1. Search the literature
2. Produce the descriptive epidemiology of a given condition, including case definition, calculation of the primary measures of disease morbidity and mortality, and appropriate comparisons by person, place and time; List the strengths and limitations of descriptive studies; Identify data from existing national and international sources; Identify the major chronic and infectious diseases, their general Pathophysiology, descriptive epidemiology and risk factors; Identify leading causes of death; Understand the general history of the development of epidemiology, including the major epidemiological studies of selected diseases; Know the principles of screening and of surveillance systems, including understanding the concepts of validity and reliability of screening tests and be able to calculate associated measures and know the types of surveillance systems and approaches used in disease surveillance; Understand the global, cultural and social context of health problems and how these influence the conduct, interpretation and dissemination of research in and intervention studies
3. Review and critically evaluate the literature (be familiar with different approaches to reviewing and synthesizing the literature); Synthesize available information; Identify meaningful gaps in knowledge
4. Formulate an original and key hypothesis or statement of the research problem; Design a study using any of the main study designs (including clinical trials and community trials)
5. Understand the advantages and limitations of each design for addressing specific problems, as well as the practical aspects of their uses, including trade-offs. This understanding will be reflected in selecting the most appropriate and efficient design for a designated problem; Calculate the requisite sample size or power based on pre-determined sample size; Identify and minimize sources of bias. Describe both the direction and magnitude of the bias and the effect of potential biases on the measures of association; Use basic population sampling methods. Use methods of measurement: design data collection forms assessing both exposures and outcomes; determine the validity and reliability of the instrument(s); identify the presence and magnitude of measurement error; and adjust for measurement error when appropriate data are available
6. Monitor the conduct and progress of data collection; Develop, implement and assess quality control measures; Create data files appropriate for analysis; and Carry out the steps needed to create new variables, clean data sets, etc.; Use statistical computer packages to calculate and display descriptive statistics, analyze categorical data and perform multivariable regression, survival analysis and other longitudinal data analyses; Examine data for the presence of confounding and interaction (effect-modification), identify their presence and manage them appropriately; Interpret the research results, make appropriate inferences based on results, and recognize the implications of the research results; Communicate research results orally and in writing to both scientists and non-scientists (includes preparation of a manuscript suitable for publication in a scientific journal and presentation of research proposals)
7. Apply this understanding as evidenced in the design and conduct of the research; Demonstrate mastery of a substantive area, including knowledge and application of that knowledge in conducting original research related to a specific topic
8. Present research data in both tabular and figure forms; Understand the concepts of human subjects procedures and confidentiality, and awareness of particular issues relevant to the study of specific populations; Experience working with large data sets.
9. Demonstrate proficiency in grant-writing for appropriate funding agencies
10. Students are encouraged to deliver data-driven talks/posters at national and international meetings in epidemiology and/or in their substantive area.

