PhD in Biostatistics Competencies

1. Describe the role of the biostatistician in medical research and public health.

2. Apply, develop, and extend as needed current statistical methods to address current and emerging issues in medicine and public health.

3. Understand the role that probability and statistical distributions play in inferential statistics and decision making.

4. Collaborate with researchers in development of the study design, strategies for collection, management and analysis of data.

5. Assist researchers in translating research questions into testable hypotheses.

6. Determine appropriate study design to evaluate interventions and risk factors.
7. Selectively apply existing hypothesis tests for comparing treatment strategies and exposure groups appropriate to the type of response measurement (e.g., binary, ordinal, continuous) and study design employed.

8. Identify those situations requiring an innovative statistical approach and develop the necessary statistical methods to solve problems of biological, biomedical, or public health importance.

9. Integrate the latest advances in statistical methods and theory into research and practice.

10. Perform power analysis and sample size calculations to aid in the planning of complex research studies.

11. Communicate to clients and colleagues the assumptions, limitations, and (dis)advantages of commonly used statistical methods and describe preferred methodological alternatives when assumptions are not met.

11. Collaborate with researchers in development of the study design, strategies for collection, management and analysis of data.

12. Use computer software for acquisition, management and analysis of data and presentation of results.

13. Present oral and written reports of methods, results and interpretations of the statistical analyses to both statisticians and non-statisticians.

14. Prepare written statistical analysis plans for clinical trials and research studies that accurately address the study hypotheses and design.

15. Develop collaborations with researchers in other disciplines.

16. Develop and teach basic and advanced materials on statistical methods and theory to students inside and outside of biostatistics.