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Doctor of Philosophy in Public Health Sciences
Biostatistics
2012-2013 Academic Year

The PhD program in Public Health Sciences prepares professionals for research, teaching, and service with the overall objective of improving the health of populations. To meet this objective, all students in the program pursue excellence in conducting research and disseminating knowledge. The primary focus is on research that advances knowledge and facilitates discovery regarding etiology, interventions, and policies that promote health at the individual, population, societal, and/or global levels. The concentration in biostatistics focuses on the reasoning and methods for using data as evidence to address public health and biomedical questions. It is an approach and a set of tools for designing studies, analyzing data, quantifying evidence, and making decisions. The PhD curriculum will prepare the student for three roles (researcher, collaborator/communicator, and educator) which are commonly expected of a Biostatistician.

Role as a Researcher: Research in biostatistics is characterized by a commitment to statistical science where foundations, methodology, and applications to the solution of public health and biomedical problems are mutually supportive. The goals of foundational research are in the development of better strategies, or ways of reasoning, for empirical studies. The goals of methodological research are in the creation of new tools or techniques for drawing inferences from data. The goals of application research are in the implementation of the aforementioned foundations and methodologies. Upon completion of the PhD in Public Health Sciences degree with a concentration in Biostatistics, the student will have demonstrated proficiency in the following research competencies:

- Perform independent research where original/new biostatistical foundations, methodologies or applications are developed.
- Review and synthesize literature and proposals critically from a biostatistical point of view in preparation for future peer-reviewed publications and grant proposals.

Role as a Collaborator/Communicator: Collaboration is characterized by a responsibility to ensure that researchers from various other disciplines have access to statistical knowledge, resources, and support which enhance the quality, integrity, and validity of their studies or projects. Communication is characterized by a demonstration of skills in written, oral, and graphical translation of statistical ideas, methods, and results in non-statistical terminology. Upon completion of the PhD in Public Health Sciences degree with a concentration in Biostatistics, the student will have demonstrated proficiency in the following collaboration and communication competencies:

- Adapt and apply existing statistical methods as dictated by the needs of a particular study or project as it relates to, but not limited to, study design and analysis.
- Effectively translate biostatistical ideas, methods, and results to collaborating colleagues.

Role as an Educator: Scholarship is characterized by the dissemination of gained knowledge to public health students, professionals, and scientists. Upon completion of the PhD in Public Health Sciences degree with a concentration in Biostatistics, the student will have demonstrated proficiency in the following scholarship competencies:

- Identify biostatistical concepts and methods needed by a specified group of people.
- Disseminate the said concepts and methods effectively through lectures and written materials.

The PhD program requires a minimum of **90 semester credit hours (SCH) post-baccalaureate degree** and is offered on a full time or part-time basis. Any graduate credits post-baccalaureate, including master's degree courses may be applied to coursework outlined within the PhD degree plan. A student may apply up to 42 SCH of previously taken graduate level courses toward the completion of the Ph.D. coursework (Advanced Standing). All such courses are subject to approval by the advisor.

Concentration-specific courses * will vary depending upon already-completed coursework of the applicant.

Public Health Sciences Core Courses	**33 SCH**
Concentration Core & Elective Courses *	**45 SCH**
Dissertation	**12 SCH**
Total	**90 SCH**

Public Health Sciences Core Courses (33 SCH)

BACH	5300	Theoretical Foundations of Individual & Community Health	3 SCH
BIOS	5300	Biostatistics for Public Health I	3 SCH
EOHS	5300	Environmental Health	3 SCH
EPID	5300	Principles of Epidemiology	3 SCH
HMAP	5300	Introduction to Health Management & Policy	3 SCH
BIOS	5310	Biostatistics for Public Health II	3 SCH
BIOS	6300	Applied Statistical Methods for Data Analysis	3 SCH
HMAP	6360	Ethical Issues in Public Health	3 SCH
PHED	6118	Seminar/Grand Rounds in Public Health Research	1 SCH
PHED	6220	Scientific and Grant Writing	2 SCH
PHED	6321	Pedagogy in Public Health	3 SCH
PHED	6310	Public Health Research Methods	3 SCH

Concentration Prerequisites (0 SCH)

Proficiency in univariate and multivariate calculus as well as linear algebra is expected.

Concentration Core Courses (30 SCH) *

BIOS	5312	Regression Analysis	3 SCH
BIOS	5314	Introduction to Statistical Packages	3 SCH
BIOS	5316	Nonparametric Statistical Methods	3 SCH
BIOS	5320	Analysis of Variance (ANOVA)	3 SCH
BIOS	6314	Applied Categorical Data Analysis	3 SCH
BIOS	6318	Clinical Trials and Survival Analysis	3 SCH
BIOS	6320	Biostatistical & Research Consulting	3 SCH
BIOS	6391	Topics in Biostatistics: Probability and Statistical Inference I	3 SCH
BIOS	6391	Topics in Biostatistics: Linear Models	3 SCH
EPID	6300	Intermediate Epidemiology for Public Health Practice	3 SCH

Concentration Electives (15 SCH) *

BIOS	6312	Applied Methods of Survey Sampling	3 SCH
BIOS	6391	Topics in Biostatistics	3 SCH

(May be taken multiple times provided the topics are different)

- Generalized Linear Models
- Statistical Genetics
- Bayesian Data Analysis
- Multivariate Analysis
- Correlated/Longitudinal Data Analysis
- Stochastic Processes
- Sequential Analysis
- Experimental Design
- Advanced Methods in Survival Analysis
- Advanced Statistical Computing
- Analysis of Missing Data
- Advanced Statistical Inference

BIOS	6399	Doctoral Independent Study in Biostatistics	3 SCH
EOHS	6348	Spatiotemporal Environmental Health Modeling	3 SCH
EPID	5391	Topics in Epidemiology (Secondary Data Analysis)	3 SCH
EPID	6310	Advanced Methods in Epidemiology I	3 SCH
PHED	6391	Advanced Topics for Public Health	3 SCH

Dissertation – 12 SCH

PHED	6395	Doctoral Dissertation (3 SCH x 4)	12 SCH

* Course substitution may be made with the approval of Academic Advisor.