

# PHEB - PUBLIC HLTH EPIDE BIOST

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## **PHEB 600 Fundamentals of Epidemiology**

**Credits 3. 3 Lecture Hours.**

This is the core epidemiology course for non-major students. It is an overview course intended to familiarize students with the basic principles and applications of epidemiological concepts and methods in the study of public health problems in populations. The focus of the course is on the interpretation and assessment of epidemiologic research, both descriptive and analytic, and its application to public health practice and relevance to the key disciplines of public health.

## **PHEB 602 Biostatistics I**

**Credits 3. 3 Lecture Hours.**

An introduction to statistical issues in public health, including basic probability, significance levels and confidence intervals, interpretation of public health data, and specific statistical techniques such as regression, analysis of variance, nonparametric techniques and categorical data.

## **PHEB 603 Biostatistics II**

**Credits 3. 3 Lecture Hours.**

A second course in biostatistical methods that emphasizes linear models and designed experiments. Designed for student wishing a deeper understanding of topics introduced in PHEB 602.

**Prerequisite:** PHEB 602.

## **PHEB 604 R Programming for Public Health Research**

**Credits 3. 3 Lecture Hours.**

Focus on basic programming skills that are essential when solving problems requiring more than merely a sequence of simple, discrete statistical and mathematical operations; relevant topics in programming in general, R language is the main vehicle for learning concepts and skills in a tangible way; includes basic data structure, looping, conditional execution, functional programming, computer graphics and use of third party packages.

**Prerequisite:** PHEB 602 or equivalent.

## **PHEB 605 Epidemiologic Methods I**

**Credits 3. 3 Lecture Hours.**

This is the core epidemiology course for major students in the Department of Epidemiology and Biostatistics. It is an overview course intended to familiarize students with the basic principles and applications of epidemiological concepts in the study of disease occurrence in populations. The focus of the course is on the interpretation and assessment of epidemiological research, as well as the design and conduct of descriptive and analytic epidemiologic studies.

## **PHEB 606 Survival Analysis**

**Credits 3. 3 Lecture Hours.**

Introduce statistical methods for survival (time-to-event) data analysis. Discuss the basic concepts of survival analysis, including hazard functions, survival functions, types of censoring, Kaplan-Meier estimates, logrank tests.

**Prerequisites:** PHEB 602 and PHEB 603.

## **PHEB 607 Sample Survey Methodology**

**Credits 3. 3 Lecture Hours.**

The purpose of this course is to prepare students to examine the unified set of concepts, principles and methodologies that govern sample survey methodology. It is designed to build on a foundation of coherent survey concepts and foster the understanding of the principles and methods of sampling theory, survey design, analysis and interpretation. This course is designed for epidemiology track and other public health students requiring a more thorough knowledge of the concepts and methods used in survey research. This course stresses survey designs, methodological issues and analytic methods as they relate to conduct of surveys.

**Prerequisites:** PHEB 602 and PHEB 603.

## **PHEB 609 Categorical Data Analysis**

**Credits 3. 3 Lecture Hours.**

This course will introduce the basic theory and applications of methods used to analyze categorical data. The theory will be covered but the emphasis will be on selecting appropriate analysis strategies, analyzing data and interpreting results of those analyses. No background in calculus or matrix algebra is required.

**Prerequisites:** PHEB 602 and PHEB 603 (or STAT 651 and STAT 652).

## **PHEB 610 Epidemiologic Methods II**

**Credits 3. 3 Lecture Hours.**

An intensive introduction to epidemiological concepts and methods for students in the epidemiology concentration and others who will collaborate in – or be required to – interpret the results of epidemiological studies. Emphasis is placed on calculation and interpretation of crude and adjusted data, measures of association, and study design. Course restricted to PHEB students only or approval of instructor required.

**Prerequisites:** PHEB 602 and PHEB 605 or concurrent enrollment in PHEB 603.

## **PHEB 611 Epidemiologic Methods III**

**Credits 3. 3 Lecture Hours.**

In-depth treatment of key methodological and analytic topics in epidemiology. Emphasis on study design and implications for data analysis, such as confounding, model selection and effect modification. Analytic techniques using logistic regression and stratified analysis will be emphasized. Restricted to PHEB students only or approval of instructor required.

**Prerequisites:** PHEB 610 and PHEB 603.

## **PHEB 612 Data Management / Computing**

**Credits 3. 3 Lecture Hours.**

An introduction to the principles of data management, techniques in designing and implementing databases for large data systems, techniques for communicating between computing environments, and introduction to statistical software.

## **PHEB 613 Field Epidemiology Methods**

**Credits 3. 3 Lecture Hours.**

Introduction to methods used by epidemiologists; conduct outbreak investigations from start to finish; study design; questionnaire development; interviewing techniques and data analysis; practical component; includes service learning component; required to sign up for EPIAssist; participation in activities with health departments local and regional.

**Prerequisites:** Public health majors, MPH in Epidemiology and Biostatistics or doctoral students from other disciplines.

**PHEB 614 Analysis of Longitudinal and Multilevel Data****Credits 3. 3 Lecture Hours.**

This course presents modern approaches to the analysis of longitudinal and multilevel data. The random effects model and the generalized estimating equations are studied. Both continuous and discrete outcome are considered. Missing data issue is discussed.

**Prerequisites:** PHEB 602, PHEB 603 and PHEB 609.**PHEB 615 Disaster Epidemiology****Credits 3. 3 Lecture Hours.**

Basic principles, terms and epidemiological tools for use in disasters; public health consequences associated with various types of disasters; rapid health assessment of disaster-affected populations; establishment of emergency surveillance systems in disaster settings; the federal and state disaster response framework; selected case studies of disasters and their effects on populations; topics related to disasters in international health settings; lecture, team exercises, case studies and discussion.

**Prerequisite:** PHEB 605.**PHEB 616 Statistical Methods of Genetics****Credits 3. 3 Lecture Hours.**

This is an elective course that will introduce students to the statistical methods used in the search for genetic factors that may be associated with diseases. While the mathematics underlying the methods will be presented, emphasis will be placed on understanding concepts, using software to analyze example data and interpreting the results of those analyses.

**Prerequisites:** PHEB 602 and PHEB 603 or STAT 651 and STAT 652.**PHEB 618 Spatial Epidemiology****Credits 3. 3 Lecture Hours.**

This course provides a broad introduction to the principles and methods of spatial epidemiology, with particular emphasis on the use and applications of Geographical Information Systems (GIS), and spatial analysis methods in health research and public health practice.

**PHEB 619 Infectious Disease Epidemiology****Credits 3. 3 Lecture Hours.**

Principles and practices of epidemiology appropriate for the study of communicable diseases. Course focuses on methodology, public health concerns, patterns of transmission and newly discovered infectious diseases.

**Prerequisite:** PHEB 600 or PHEB 605.**PHEB 620 Cancer Epidemiology****Credits 3. 3 Lecture Hours.**

A review of the principles and methods used in cancer epidemiology. The course focuses on cancer etiology and control with emphasis on race/ethnicity and urban/rural differences in cancer incidence and mortality.

**Prerequisite:** PHEB 600 or PHEB 605.**PHEB 621 Foundations of Maternal and Child Health****Credits 3. 3 Lecture Hours.**

Determinants, mechanisms systems that maintain health, safety, well-being of children and their families in communities and societies; introduction to maternal and child health populations; conceptual frameworks; health indicators; research issues, program planning and evaluation.

**PHEB 622 Reproductive And Perinatal Epidemiology****Credits 3. 3 Lecture Hours.**

Epidemiology of major reproductive health outcomes, including infertility, fetal loss, birth weight, congenital malformations and infant mortality.

Review of current knowledge of determinants of these outcomes.

**Prerequisite:** PHEB 600 or PHEB 605.**PHEB 624 Social Epidemiology****Credits 3. 3 Lecture Hours.**

This course entails an exploration and examination of the social determinants and distribution of physical and mental health outcomes. These determinants include socioeconomic inequalities, stress and social organization. The course focuses on the development and evaluation of testable hypotheses concerning the relationship between social conditions and health.

**Prerequisite:** PHEB 600 or PHEB 605.**PHEB 625 Survey and Missing Data Analysis****Credits 3. 3 Lecture Hours.**

Understanding and application of common methodologies; analysis of complex sample survey data and related missing data problems; survey sampling methods and analytic methods.

**Prerequisites:** PHEB 602, PHEB 603 or equivalent; PHEB 609 preferred but not required; public health majors.**PHEB 626 Occupational And Environmental Epidemiology****Credits 3. 3 Lecture Hours.**

This course involves the examination of occupational and environmental exposures related to disease and injury. Topics covered include general methods used in occupational and environmental epidemiology, exposure assessment, surveillance, and the relation of occupational and environmental exposure to adverse reproductive outcomes, cancer, diseases and the ergonomic-related outcomes.

**Prerequisite:** PHEB 600 or PHEB 605.**PHEB 627 Chronic Disease Epidemiology****Credits 3. 3 Lecture Hours.**

This course will provide insight into the epidemiologic concepts and research needed in the study of chronic disease and its associated risk factors. This course is intended to provide students with an appreciation of the major trends in the incidence and prevalence of specific chronic diseases. The focus will be from a U.S. and international perspective. Methodological challenges relevant to chronic disease epidemiologic research will be addressed in lectures, readings, student discussions, presentations and assignments.

**Prerequisite:** PHEB 605.**PHEB 628 Chronic Diseases: Primary and Secondary Prevention****Credits 2. 2 Lecture Hours.**

This course exposes students to the breadth of chronic diseases affecting public health and methods of prevention, including: 1) Screening for Early and Asymptomatic Conditions, 2) Development of Guidelines, 3) Cancer, 4) Cardiovascular Disease, 5) Diabetes, 6) Other conditions: Respiratory Diseases, Musculoskeletal Disorders, Disabilities, Traumatic Injuries, Neurological Disorders, Psychiatric Illness and Stress, Childhood Cognitive Disorders, Kidney and Liver Diseases, Skin Disorders, Visual and Hearing Disorders, Blood Disorders, 7) Tobacco Use, 8) Obesity and Nutrition. Restricted to MD or DO in Preventive Medicine Residency.

**PHEB 630 Public Health Epidemiology For Military Personnel****Credits 3. 3 Lecture Hours.**

This course provides an introduction to Epidemiology and all students will emerge with the tools needed to identify, analyze and apply interventions useful in understanding how disease occurs, propagates and is controlled.

**PHEB 634 Environmental Epidemiology****Credits 3. 3 Lecture Hours.**

Principles and methods of environmental epidemiology; emphasis on the use of epidemiologic and exposure assessment methods and practice applied to the issues of environmental public health and epidemiology of environmentally-related diseases and injuries.

**Prerequisite:** PHEB 605 or instructor approval.

**PHEB 681 Seminar****Credit 1. 1 Lecture Hour.**

Series of presentations by students, faculty, national and international guest speakers; presentations on various maternal and child (MCH) topics; experience in presenting research and improving presentation skills; introduction to research topics of faculty and external MCH experts; increase knowledge of the MCH field.

**PHEB 684 Practicum****Credits 1 to 3. 1 to 3 Other Hours.**

Field placement experience in which students work closely with a departmental faculty member and (an) appropriate field professional(s) applying skills and techniques acquired through coursework. Must be taken on a satisfactory/unsatisfactory basis.

**Prerequisite:** Approval of student's academic advisor.

**PHEB 685 Directed Study****Credits 1 to 6. 0 Lecture Hours. 1 to 6 Other Hours.**

Student investigation of a topic not covered by other formal courses. May be repeated for credit.

**Prerequisite:** Approval of student's academic advisor.

**PHEB 686 Directed Research****Credits 1 to 3. 0 Lecture Hours. 1 to 3 Other Hours.**

Student research initiative not within the scope of a thesis or dissertation. May be repeated for credit.

**Prerequisite:** Approval of student's academic advisor.

**PHEB 689 Special Topics****Credits 1 to 3. 1 to 3 Lecture Hours.**

Revolving topics seminar in an area of specialization within the department. May be repeated for credit.

**PHEB 691 Research****Credits 1 to 6. 0 Lecture Hours. 1 to 6 Other Hours.**

Research for thesis or project. May be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis. Must be taken on a satisfactory/unsatisfactory basis.

**Prerequisite:** Approval of the student's academic advisor and department head.

**PHEB 791 Doctoral Capstone****Credits 1 to 9. 0 Lecture Hours. 1 to 9 Other Hours.**

Doctoral dissertation or equivalent project(s). May be repeated for credit. Must be taken on a satisfactory/unsatisfactory basis.