Applied Biostatistics, M.P.H.

COLLEGE OF PUBLIC HEALTH (http://cph.temple.edu)

About the Program

The Master of Public Health in Applied Biostatistics is a unique and newly developed degree in response to the growing need for master's-trained professionals with expertise in advanced biostatistical methods. The program is designed to train professionals in the field of public health who have a clear understanding of and expertise in the use, statistical application, and interpretation of large and complex data sets; of the critical importance of valid study designs and analytic methods; and of the application of hypothesis-based development and statistical programming and testing. Students complete their studies with an understanding of the fundamental critical thinking skills and statistical/programming competencies necessary for public health practice and Applied Biostatistics in accordance with Council on Education for Public Health (CEPH) standards. Applied Biostatistics courses address topics such as database coding and development; environmental surveillance; multivariate biostatistics, including the use of regression models and multifactorial analysis; research design; and risk assessment and statistical analysis in human disease. Students in the Applied Biostatistics program are trained in the M.P.H. core competencies while gaining skills to use and apply multiple statistical program packages, including SPSS, SAS, STATA, and R; develop appropriate study designs based on appropriate research questions; and interpret and present study results to various audiences. Thus, the M.P.H. in Applied Biostatistics at Temple University is particularly poised to foster interdisciplinary research and train students to work in an interdisciplinary environment.

Time Limit for Degree Completion: 4 years

Campus Location: Main. Some required and elective courses are offered at satellite campuses and through online courses, but the full M.P.H. program is currently available only at Main Campus.

Full-Time/Part-Time Status: Students can complete the degree program through evening classes and online courses. Full-time students usually complete the program within two academic years. Part-time students usually take three to four years to complete their degree.

Interdisciplinary Study: Interdisciplinary M.P.H. coursework, research, and interactions are encouraged to give students as broad a perspective as possible in the complex, diverse, and dynamic state of public health. Through associations with the Center for Obesity Research and Education, Center for Women’s Health, and others, students have access to over 100 faculty at Temple University and additional regional scholars who are actively involved in programs, research, and teaching in public health. Further, as with the other four M.P.H. degree programs offered by the College of Public Health, the M.P.H. in Applied Biostatistics can be undertaken as part of these nine dual M.P.H. degree programs:

- D.M.D./M.P.H. with Temple University’s Kornberg School of Dentistry
- D.O./M.P.H. with the Philadelphia College of Osteopathic Medicine
- D.P.M./M.P.H. with the Temple University School of Podiatric Medicine
- J.D./M.P.H. with Temple University’s Beasley School of Law
- M.D./M.P.H. with the Lewis Katz School of Medicine at Temple University
- M.H.A./M.P.H. with Temple University’s Fox School of Business and Management
- M.P.P./M.P.H. with Temple University’s College of Liberal Arts
- M.S. Health Informatics/M.P.H. within the Temple University College of Public Health
- M.S.W./M.P.H. with the Temple University School of Social Work

For more information, visit https://cph.temple.edu/mph/dual-degrees.

Affiliation(s): Locally, the program has long-standing research affiliations with The Food Trust, Fox Chase Cancer Center, Health Federation of Philadelphia, Philadelphia Department of Public Health, Public Health Management Corporation (PHMC), School District of Philadelphia, Temple University Health System, and numerous other community health agencies.

Study Abroad: Short-term intensive study abroad courses are offered as part of the M.P.H. program of study. These courses are offered during the Summer and are open to both undergraduate and graduate students.

Accreditation: The M.P.H. is fully accredited by the Council on Education for Public Health (CEPH). Achieving accreditation in 1985, Temple’s M.P.H. program is one of the longest established accredited M.P.H. programs in community health in the country.

Areas of Specialization: The M.P.H. degree program is offered in five specialty fields of study:

- Applied Biostatistics (APBIO)
- Environmental Health (EH)
- Epidemiology (EPI)
- Health Policy and Management (HPM)
In addition, a certificate in Global Health is available to all students in the M.P.H. program. Students are able to complete this transcripted concentration by utilizing their three elective courses for Global Health classes.

Job Prospects: Graduates with an M.P.H. in Applied Biostatistics are employed in research institutions, such as universities and medical centers; at government agencies at the federal level, such as the Centers for Disease Control and Prevention, as well as local and state governments; and in private industry, including pharmaceutical firms, in positions such as research associates and statisticians.

Licensure: Students who complete an M.P.H. at Temple University are eligible to sit for the Certification in Public Health (CPH) exam and the Certified Health Education Specialist (CHES) exam. For information regarding credentialing in public health, see http://www.nchec.org/.

Non-Matriculated Student Policy: Non-matriculated students are required to speak with an advisor before registering for classes and to obtain the permission of the professor. If accepted to the program, a maximum of three courses may be applied toward the degree program. Exceptions to this policy relate to formal certificate programs.

Financing Opportunities: The Graduate School awards fellowships on a competitive basis only to students with outstanding academic records who are admitted to Temple University for the Fall term. Applicants who wish to be considered for fellowships must apply no later than January 26 for consideration for the Fall term. The department's Admissions Committee nominates outstanding students for these awards, but the Graduate Board's Fellowship Committee makes all award decisions.

Limited Teaching and Research Assistantships are available in the College of Public Health. The Graduate School website details levels of support, benefits, and the terms and conditions of these types of graduate student support at http://www.temple.edu/grad/finances/. Assistantships are awarded on a term or annual basis. Students whose Fall applications are complete prior to or at the application deadline are reviewed for eligibility for Teaching Assistant (TA) positions. TAs are required to work 20 hours per week in any combination of teaching assignments made by the department and must meet the English Language Proficiency standards set by the University and the College. Students who hold Teaching or Research Assistantships are not permitted to hold other employment without the written prior approval of their advisor, the Director of Graduate Programs, and the Graduate School. To be considered for a Teaching or Research Assistantship, complete an application form that is sent to students upon admission to the M.P.H. program. The completed application must be returned to publichealth@temple.edu to be considered.

The College of Public Health has a limited number of scholarship opportunities available for M.P.H. students. Available scholarships are listed at https://cph.temple.edu/cph/giving/scholarshipsfunds. Students may also be eligible for financial support through the Office of Student Financial Services. See http://sfs.temple.edu/.

**Admission Requirements and Deadlines**

**Application Deadline:**
- **Fall:** March 1
- **Spring:** November 1

All applicants to the M.P.H. program must apply via the Centralized Application Service for Public Health (SOPHAS). The system can be accessed at https://sophas.liaisoncas.com/.

Applicants should check their application status on the SOPHAS (https://sophas.liaisoncas.com/applicant-ux) portal often and inquire directly of SOPHAS about receipt of materials. For other questions, please contact Theresa White, Senior Graduate Advisor, at theresawhite@temple.edu or 215-204-5105.

**Letters of Reference:**
- **Number Required:** 3

From Whom: Letters of recommendation, which are completed electronically through the SOPHAS (https://sophas.liaisoncas.com/applicant-ux) system, should be obtained from college/university faculty members familiar with academic competence. If the applicant has been out of school for a long time, please ensure that letters are from professional colleagues and that they address academic abilities, such as writing and research.

**Coursework Required for Admission Consideration:** Applicants' files are reviewed for undergraduate coursework in mathematics and/or statistics, social science, and writing.

**Bachelor's Degree in Discipline/Related Discipline:** A baccalaureate degree is required.

**Statement of Goals:** In 500 to 1,000 words, address the following items:

- What are your interests in Public Health, and why are you planning to pursue an M.P.H. in Applied Biostatistics?
- What are your future career goals, and what have you done either academically or professionally to guide your interest in Public Health?
- Are there any exceptional circumstances related to previous academic performance that you would like the Admissions Committee to consider?
Standardized Test Scores:
GRE: Required. While the program takes a portfolio approach to admissions, standardized tests provide important insight into quantitative and verbal abilities. Minimum scores are 500 (old test) on both the verbal and quantitative sections or, on the new test, 153 on the verbal section and 144 on the quantitative section.

Standardized tests considered in lieu of the GRE include DAT, GMAT, MCAT, OAT, and PCAT. The LSAT, which is also considered for some M.P.H. specialties, is not accepted when applying for Applied Biostatistics or Epidemiology.

TOEFL: 79 iBT or 550 PBT minimum.

Clearances: The M.P.H. programs require students to complete clinical/field education experiences at facilities both on and off Temple University’s campuses. These placements may require criminal background checks, Act 33/34 clearances, and perhaps a drug screen. The results of these requirements may limit and potentially eliminate placement options for the student, thus resulting in her/his inability to meet graduation requirements.

Resume: Current resume or CV required.

Transfer Credit: Graduate credits from an M.P.H. program accredited by the Council on Education for Public Health (CEPH) may be transferred into the M.P.H. The credits must be equivalent to coursework offered at Temple, and the grade must be a "B" or better in order to transfer. The M.P.H. advisor approves the transfer of credits based on a review of course materials provided by the student. The maximum number of credits a student may transfer is 9.

Test Waivers: Graduates with a terminal degree from a U.S. medical school, foreign-trained physicians who have obtained licensure to practice in the United States, and those with Ph.D.’s may have the GRE requirement waived.

Program Requirements

General Program Requirements:
Number of Credits Required Beyond the Baccalaureate: 45

Required Courses:

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<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tr>
<td>HRPR 5001</td>
<td>Current and Emerging Issues in Public Health and Health Professions</td>
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<tr>
<td>ENVH 5103</td>
<td>Environmental Health</td>
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<tr>
<td>EPBI 5002</td>
<td>Biostatistics</td>
<td>3</td>
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<tr>
<td>EPBI 5201</td>
<td>Epidemiological Research Methods I</td>
<td>3</td>
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<td>HPM 5006</td>
<td>Political and Economic Aspects of Health</td>
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<td>SBS 5001</td>
<td>Fundamentals of Public Health</td>
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<tr>
<td>SBS 5102</td>
<td>Theoretical Foundations of Health Behavior</td>
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Applied Biostatistics Courses

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<th>Code</th>
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<tr>
<td>EPBI 8001</td>
<td>Research Methods in Public Health</td>
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<tr>
<td>EPBI 8012</td>
<td>Multivariable Biostatistics</td>
<td>3</td>
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<tr>
<td>EPBI 8208</td>
<td>Data Management and Analysis</td>
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Applied Biostatistics Elective

Select one of the following:

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<tr>
<td>ENVH 8016</td>
<td>Human Health Risk Analysis</td>
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<tr>
<td>EPBI 8201</td>
<td>Structural Equation Modeling</td>
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<td>EPBI 8203</td>
<td>Public Health Data Reporting</td>
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<td>EPBI 8204</td>
<td>Multilev Mod in Int Res</td>
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<td>EPBI 8307</td>
<td>Systematic Reviews</td>
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<td>EPBI 9187</td>
<td>Biostat Cnslt Practicum</td>
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<td>PSY 8041</td>
<td>Factor Analysis and Scaling</td>
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Electives

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<th>Code</th>
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<td>M.P.H. Fieldwork Experience</td>
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<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>EPBI 9289</td>
<td>MPH Fieldwork I</td>
<td>3</td>
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Internship: An internship is required as part of a student's M.P.H. fieldwork.

Culminating Events:

Fieldwork Practicum:
M.P.H. fieldwork requires a student to synthesize and integrate the knowledge acquired in coursework and other learning experiences and to apply theory and principles in a situation that approximates some aspect of professional practice through an internship or practicum experience with a public health agency or under the supervision of a faculty preceptor. The M.P.H. fieldwork experience serves as the culminating event as required by the Council on Education for Public Health (CEPH), the accrediting body of all U.S. schools of public health, for completion of the Master of Public Health degree. In addition, this culminating experience provides the student with the opportunity to develop expertise in a topic area and to contribute original and independent observations to a body of knowledge.

For the culminating experience to fulfill the requirements of EPBI 9289 and EPBI 9389, M.P.H. in Applied Biostatistics students are expected to complete a fieldwork experience, which enables them to:

- Describe the roles biostatistics serves in the discipline of public health.
- Apply basic statistical methods for summarizing public health data and for inference.
- Interpret and present results from the application of basic statistical techniques.
- Distinguish among the different measurement scales and, based on these distinctions, recognize the implications for selection of appropriate statistical methods.
- Apply descriptive techniques commonly used to summarize public health data.
- Recognize concepts of probability, random variation, and commonly used statistical probability distributions.
- Apply common statistical methods for inference, including estimation, confidence intervals, and hypothesis testing.
- Use appropriate statistical software and make proper interpretations based on the output.
- Be trained in a variety of common statistical programs and languages.
- Gain hands-on experience working with existing databases while being mentored on a culminating project.
- Incorporate public health practices when conducting and interpreting analytic results.
- Describe preferred methodological alternatives to commonly used statistical methods.
- Develop written and oral presentations based on statistical analyses for both public health professionals and educated lay audiences.
- Apply basic informatics techniques with vital statistics and public health records in the description of public health characteristics and in public health research and evaluation.

A final paper is the required deliverable for the M.P.H. fieldwork requirement. Students must also demonstrate their proficiency and the application of theory and principles in the paper and demonstrate mastery of the required competencies during the oral defense. The evaluation of the M.P.H. fieldwork practicum experience, therefore, is integrated into the culminating experience requirement.

Contacts

Program Web Address:
https://cph.temple.edu/epibio/programs-offered/graduate/mph-biostatistics

Department Information:
Dept. of Epidemiology and Biostatistics
Ritter Hall Annex, 9th Floor (004-09)
1301 Cecil B. Moore Avenue
Philadelphia, PA 19122-6005
publichealth@temple.edu
215-204-8726

Submission Address for Application Materials:
https://sophas.liaisoncas.com/

Department Contacts:
Admissions:
CPH Office of Admissions
cph@temple.edu
Courses

EPBI 5002. Biostatistics. 3 Credit Hours.
This course introduces applied biostatistics as used in research in public health. Topics of study include statistical methods used for descriptive and analytic research, inferential statistics, surveillance systems, and statistical software used in public health.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
College Restrictions: Must be enrolled in one of the following Colleges: College of Public Health, Social Work.

Repeatability: This course may not be repeated for additional credits.

EPBI 5003. Spatial Analysis in Public Health. 3 Credit Hours.
This course will create a methodological framework for approaching public health issues within the context of spatial investigations of health and disease, both internally via perceptual mapping, and externally via geographic information systems (GIS). This integrative discipline provides the opportunity for students to draw upon the concepts and techniques of sound public health and add a spatial perspective to their analysis.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EPBI 5101. Fundamentals of Epidemiology. 3 Credit Hours.
This course introduces descriptive and analytical epidemiology. Concepts and methods used in public health are covered, with emphasis on the calculation and interpretation of indices of community health; morbidity and mortality rates; age-adjustment; and risk ratios, sensitivity, specificity, and predictive value of screening tests. Surveyed are epidemiological research designs, surveillance systems, and evidence-based practice guidelines. Note: This is an introductory course for students in public health and related fields. Master's and doctoral students who have strong quantitative skills and plan to conduct epidemiological research should enroll in EPBI 5201.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EPBI 5201. Epidemiological Research Methods I. 3 Credit Hours.
This course provides an introduction to the fundamentals of conducting epidemiologic research and protocol development. It covers definitions of epidemiology; measures of disease frequency and risk assessment; measures of effect and association; epidemiologic study designs, including randomized clinical trials, cohort, case-control studies, and cross-sectional surveys; assessment of screening programs; an overview of the role of bias and confounding in epidemiologic study results; and analytic techniques, including modeling using multiple variables, survival analysis, and issues related to quality assurance. Note: This course is the introductory epidemiology course for students in the M.S. in Epidemiology or related Public Health degree programs that require advanced quantitative methods. May be taken in place of EPBI/PBHL 5101 for students in the M.P.H., M.S. in Environmental Health and Ph.D. programs.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EPBI 5204. Mental Health Epidemiology. 3 Credit Hours.
Epidemiology of psychiatric disturbances is explored, including alcohol and other drug dependencies, psychosocial aspects of health and illness. The emphasis is on epidemiologic methods and theories in psychosocial and mental health research.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
College Restrictions: Must be enrolled in one of the following Colleges: College of Public Health, Social Work.

Repeatability: This course may not be repeated for additional credits.
EPBI 5500. Seminar in Current Issues in Public Health. 3 Credit Hours.
Seminar topics rotate to address current issues in public health research, policy and practice.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
College Restrictions: Must be enrolled in one of the following Colleges: College of Public Health, Social Work.

Repeatability: This course may be repeated for additional credit.

EPBI 8001. Research Methods in Public Health. 3 Credit Hours.
This course examines how to develop and test models, formulate research problem statements and hypotheses, and implement and evaluate research designs and methods of data collection in public health research. It concentrates on fundamental concepts in research design and measurement that help prepare the student to plan and implement theoretically informed and methodologically sound scientific studies in public health and to critically evaluate and discuss public health research. The course emphasizes ethical and practical methods of studying and evaluating causal relations (efficacy and internal validity); determining generalizability of observations (effectiveness, external and ecological validity); and accurate and reliable measuring and conceptualizing of variables (construct validity). In addition, it covers systematic literature searches and randomized controlled trials, which are both increasingly important methods for conducting research in public health.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
College Restrictions: Must be enrolled in one of the following Colleges: College of Public Health, Social Work.

Repeatability: This course may not be repeated for additional credits.

EPBI 8002. Research Seminar in Public Health. 3 Credit Hours.
This is a research seminar on linkages between theory and research in social and behavioral health studies. It is required for Ph.D. students prior to taking the preliminary examinations.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EPBI 8011. Social Epidemiology. 3 Credit Hours.
The purpose of this course is to provide an introduction for graduate students to the key social factors that are thought to influence health. These social factors include constructs such as gender, race, socioeconomic status, and social support. Understanding these social factors is important for public health research and practice. These factors can be considered "fundamental causes" of health outcomes insofar as they may cause or modify other factors that are known to influence health, such as individual behaviors or genetics. The course will focus on the conceptual and theoretical basis of these social factors, how these social factors are measured in epidemiologic research, and the mechanisms by which these social factors are thought to affect health. Students will have the opportunity to improve their skills in critically evaluating empirical data about the association between these social factors and health.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

College Restrictions: Must be enrolled in one of the following Colleges: College of Public Health, Social Work.

Repeatability: This course may not be repeated for additional credits.

Pre-requisites:
EPBI 5101|Minimum Grade of B-|May not be taken concurrently
OR PBHL 5101|Minimum Grade of B-|May not be taken concurrently
OR EPBI 5201|Minimum Grade of B-|May not be taken concurrently
OR PBHL 5201|Minimum Grade of B-|May not be taken concurrently.

EPBI 8012. Multivariable Biostatistics. 3 Credit Hours.
The objective of the course is to provide basic theory and application of regression models, analysis of variance, nonparametric statistics, and survival analysis applied to the analysis of population-based data. The emphasis will be on generating and interpreting results and health related applications rather than on statistical theory. The course is designed for graduate students in public health who are already familiar with basic statistical concepts, including descriptive statistics, the components of statistical inference (p-values, hypothesis tests, confidence intervals, etc.), as well as concepts of confounding and effect modification.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

Pre-requisites:
EPBI 5002|Minimum Grade of B-|May not be taken concurrently
OR PBHL 5002|Minimum Grade of B-|May not be taken concurrently.
EPBI 8201. Structural Equation Modeling. 3 Credit Hours.
An extremely rapid pace of change in statistics and methodology in the field of developmental processes and family systems requires that graduate students (and newly minted PhDs in academic and applied settings) be well versed in current data analytic techniques and able to keep abreast of emergent techniques by being aware of contemporary methodological literature. This course will illustrate the uses of structural equation models for cross-sectional, longitudinal, and family data analysis. The course is organized to take participants through each of the cumulative steps in the analysis: deciding which type of model is appropriate, setting up the data file and coding variables, interpreting and displaying empirical findings, and presenting results in both verbal and written form. Class time will be devoted primarily to lectures, examples, group discussions, and hands-on application of course material.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EPBI 8202. Epidemiological Research Methods II. 3 Credit Hours.
The content of this course illustrates statistical concepts, methods, and strategies used in epidemiologic studies, beyond the principles discussed in EPBI/PBHL 5201 (Epidemiological Research Methods 1). Topics include a review of basic study designs, analysis of prospective and retrospective data, assessment of bias, confounding, effect modification/interaction, statistical methods of stratification and adjustment, sample size/power calculations, importance of quality control and data monitoring in randomized clinical trials, critical determination of causality, and the comprehensive analyses, reporting and presentation of epidemiologic results.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

Pre-requisites:
EPBI 5201|Minimum Grade of B-|May not be taken concurrently
OR PBHL 5201|Minimum Grade of B-|May not be taken concurrently.

EPBI 8203. Public Health Data Reporting. 3 Credit Hours.
Systematic reviews are essential tools for health care workers, researchers, consumers, and policymakers who need to keep abreast of the accumulation of knowledge within their field. Systematic reviews provide more objective evaluation of the evidence than has been possible with traditional narrative reviews, and so can help resolve uncertainty and point toward promising future directions in research and practice. When appropriate, meta-analyses can help increase the precision of estimates regarding treatment effects and way to improve treatments. For example, identification of subgroups of individuals most (or least) likely to benefit from treatment can generate new questions to be addressed.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

Pre-requisites:
EPBI 5101|Minimum Grade of B-|May not be taken concurrently
OR PBHL 5101|Minimum Grade of B-|May not be taken concurrently
OR EPBI 5201|Minimum Grade of B-|May not be taken concurrently
OR PBHL 5201|Minimum Grade of B-|May not be taken concurrently.

EPBI 8204. Multilev Mod in Int Res. 3 Credit Hours.
Interdisciplinary research nearly always involves data with a nested, hierarchical, or multilevel structure. Such data violate the standard statistical assumption of independence of observations. As well, the most important interdisciplinary research questions often involve understanding effects of one level of this structure on characteristics of another level of structure. Within the intervention contexts, individuals often serve as their own context as events unfold over chronological time. This course provides a broad and comprehensive introduction to analysis of multilevel data with an emphasis on questions which bridge disciplines. Participants should be familiar with the general linear model (analysis of variance, regression) prior to enrolling in this course, but no previous familiarity with mixed models (other than repeated measures ANOVA) is assumed.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.
EPBI 8205. Chronic Disease Epidemiology. 3 Credit Hours.
This intermediate course will cover selected topics in chronic disease epidemiology through critical examination of the current literature. Students will have the opportunity to study methodological issues, strategies for prevention, and contemporary issues in research. Coronary heart disease, cancer, diabetes, musculoskeletal disorders, chronic lung diseases and others will be addressed.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

Pre-requisites:
SBS 5102|Minimum Grade of B-|May not be taken concurrently
OR PBHL 5102|Minimum Grade of B-|May not be taken concurrently
OR EPBI 5201|Minimum Grade of B-|May not be taken concurrently
OR PBHL 5201|Minimum Grade of B-|May not be taken concurrently.

EPBI 8206. Infectious Disease Epidemiology. 3 Credit Hours.
This course provides the basis for understanding infectious diseases, disease transmission, risk factors, outbreak investigation and study designs, surveillance methods, and current infection-control strategies and mechanisms. The purpose of this course is to expose students to the principles and practices of infectious disease epidemiology and how communicable diseases and their control affect public health locally, nationally, and internationally.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

Pre-requisites:
SBS 5102|Minimum Grade of B-|May not be taken concurrently
OR PBHL 5102|Minimum Grade of B-|May not be taken concurrently
OR EPBI 5201|Minimum Grade of B-|May not be taken concurrently
OR PBHL 5201|Minimum Grade of B-|May not be taken concurrently.

EPBI 8208. Data Management and Analysis. 3 Credit Hours.
The content of this course will illustrate practical concepts, methods, and strategies used in the development, management and analysis of large data sets through in-class and homework exercises, quizzes, and a final project. Each class session will be a mixture of a lecture, demonstration and hands-on SAS programming exercises.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

Pre-requisites:
EPBI 5002|Minimum Grade of B-|May not be taken concurrently
OR EPBI 8012|Minimum Grade of B-|May not be taken concurrently.

EPBI 8209. Epidemiology of HIV/AIDS. 3 Credit Hours.
The epidemiology of HIV/AIDS is the subject of this course. Application of epidemiological principles and concepts in infectious disease epidemiology with emphasis on surveillance, research, prevention, and control are covered.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

Pre-requisites:
EPBI 5101|Minimum Grade of B-|May not be taken concurrently
OR PBHL 5101|Minimum Grade of B-|May not be taken concurrently
OR EPBI 5201|Minimum Grade of B-|May not be taken concurrently
OR PBHL 5201|Minimum Grade of B-|May not be taken concurrently.
EPBI 8211. Epidemiology Grand Rounds. 1 Credit Hour.
The purpose of this course is to socialize, inform and engage graduate-level students in the broader profession of public health through promoting attendance of lectures and background readings of publications for invited speakers through the College of Public Health (CPH). This is a required course for the PhD Epidemiology program. The course will enable students to interact with researchers and practitioners from other settings and universities both nationally and internationally. The course will build students' capacity to work in interdisciplinary teams and address challenging and complex public health problems. Four CPH invited speakers who are presenting their work on substantive programs in a wide range of public health topics will be identified. Enrollment in this course requires that students participate and attend the selected CPH sponsored lectures or symposiums during the term for which they are enrolled as well as participate in course specific meetings and deliverables. For example, prior to the lecture, students will conduct a guided literature search and develop a written review of the state-of-knowledge and gaps in literature related to the speaker's topic. Students will also participate in a directed discussion prior to the invited lecture. Following the discussion, students will attend the lecture, meet with the invited speaker to ask questions, and complete a summary paper outlining the invited speaker's contribution to the science.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

Pre-requisites: (EPBI 5101|Minimum Grade of B-|May be taken concurrently)
OR EPBI 5201|Minimum Grade of B-|May be taken concurrently)
AND (EPBI 5002|Minimum Grade of B-|May be taken concurrently)

EPBI 8212. Grantsmanship in Health Research. 3 Credit Hours.
This course will provide students with applied advanced epidemiologic research methods to critically assess gaps in current knowledge and to develop a competitive grant proposal application. Students will apply the epidemiologic methods and knowledge from prior courses and gain expertise in assessing gaps in knowledge, innovative thinking, grant conception, development and writing, study implementation and approach, budget preparation, and grant critiques. In the first half of the course, students will be introduced to the concepts of significance and innovation, identifying gaps in knowledge, choosing an epidemiologic research topic, identifying a funding agency and developing a set of specific aims, significance and innovation statements. In the second half of the course, the grant proposal will be written in the format of an NIH pre-doctoral epidemiology research grant following NIH grant application guidelines including a developed research plan, identified research team, and NIH biosketch and human subject protection plans. Students will be introduced to the concepts of power, sample size and effect size and will calculate necessary power and sample size requirements in the finalized grant proposal. Students will also participate in a mock grant review session. Students will use this opportunity to develop and submit an application for an NIH or foundation pre-doctoral award to support their dissertation work.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

Pre-requisites: EPBI 5002|Minimum Grade of B-|May not be taken concurrently.

EPBI 8301. Clinical Research Methods in Public Health. 3 Credit Hours.
This course provides an introduction to the core topics in clinical research. Beginning with practical issues in starting and advancing in a career in clinical investigation, the course proceeds to cover diagnosis and treatment studies, research on prognostic and casual risk factors, special types of study design and analyses, principles of measurement in human subjects, studies using secondary databases, and outcomes research. This course will be an elective class for all students enrolled in the Master of Science in Epidemiology, Clinical Research and Translational Medicine, as well as the Doctor of Philosophy in Epidemiology programs. This graduate level course is principally aimed at health care professionals, not limited to the field of public health, usually with graduate courses relevant to their clinical discipline, who desire advanced knowledge and skills in evaluating, designing and implementing clinical research studies.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

Pre-requisites: 

EPBI 8302. Behavioral Measurement. 3 Credit Hours.
This course will cover the classical and modern test theories and their applications to solve measurement problems in practice. This course will educate students on measurement concepts including test standardization, validity, reliability, operational definitions, scaling and latent variables in social and behavioral sciences. Issues surrounding validity and reliability of measures will be discussed in detail. Students will be given an opportunity to critically evaluate existing measures and to propose how a new measure can be developed and evaluated.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

Pre-requisites:
EPBI 5002|Minimum Grade of B-|May not be taken concurrently
OR EPBI 8012|Minimum Grade of B-|May not be taken concurrently.

EPBI 8307. Systematic Reviews. 3 Credit Hours.
Systematic reviews are essential tools for health care workers, researchers, consumers, and policymakers who need to keep abreast of the accumulation of knowledge within their field. Systematic reviews provide more objective evaluation of the evidence than has been possible with traditional narrative reviews, and so can help resolve uncertainty and point toward promising future directions in research and practice. When appropriate, meta-analyses can help increase the precision of estimates regarding treatment effects and way to improve treatments. For example, identification of subgroups of individuals most (or least) likely to benefit from treatment can generate new questions to be addressed.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EPBI 9083. Readings and Conference in Public Health. 1 to 3 Credit Hour.
This is an advanced tutorial in public health with an appropriate faculty member. Note: Registration requires a written contract with the supervising faculty member and approval of the student's advisor and of the Director of Graduate Programs.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may be repeated for additional credit.

EPBI 9187. Biostat Cnslt Practicum. 3 Credit Hours.
The objective of this course is to prepare students to collaborate effectively as biostatistics support consultants in the health professions. The emphasis will be to refresh statistical techniques and develop communication and problem solving skills. This course is designed for graduate students in public health who can use well-validated commercial statistical software, such as SAS, for the analyses of data from observational and/or interventional research studies.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may be repeated for additional credit.

EPBI 9189. MPH Capstone Seminar. 3 Credit Hours.
This seminar is required of M.P.H. students during final year of study. The seminar includes integration of coursework and practice skills to develop a fieldwork project or internship in a public health agency.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may be repeated for additional credit.

EPBI 9289. MPH Fieldwork I. 3 Credit Hours.
This course entails a fieldwork project or internship in a public health agency. It includes seminars, oral and written reports of progress, and joint supervision by a preceptor and faculty member.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

EPBI 9389. MPH Fieldwork II. 3 Credit Hours.
This course is an evaluation of the fieldwork project or internship using a full range of research methodologies. Data are collected, analyzed, and reported in a comprehensive final report. Oral and/or poster presentations are presented to public health organizations. The course includes a final oral defense of the project or internship.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.
EPBI 9991. Independent Project in Environmental Health. 1 to 3 Credit Hour.
Under the direction of an appropriate graduate faculty member, students tie together their coursework in a project that poses a problem, gathers data to help analyze the problem, and provides a solution. Note: Enrollment must be approved by the student's advisor and the Director of Graduate Programs.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may be repeated for additional credit.

EPBI 9994. Preliminary Examinations. 1 Credit Hour.
This course supports preparation for taking the preliminary examinations in the Health Policy and Social and Behavioral Sciences Ph.D. programs. To enroll, students must have completed all required coursework for the Ph.D. and obtain the approval of the Ph.D. Program Director. Students must be enrolled to take the required preliminary examinations.

Department Restrictions: Must be enrolled in one of the following Departments: CPH:Epidemiology/Biostatistics.
Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
Degree Restrictions: Must be enrolled in one of the following Degrees: Doctor of Philosophy.

Repeatability: This course may be repeated for additional credit.

EPBI 9996. Masters Res in Pub Hlth. 3 Credit Hours.
This course is limited to students who have chosen to fulfill the master's degree by writing a thesis.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may be repeated for additional credit.

EPBI 9998. Dissertation Proposal Research. 1 to 2 Credit Hour.
This course supports preparation of the dissertation proposal. The course is required for students who have passed the preliminary examinations for their PhD program and who have not yet defended the dissertation proposal.

Department Restrictions: Must be enrolled in one of the following Departments: CPH:Epidemiology/Biostatistics.
Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
Degree Restrictions: Must be enrolled in one of the following Degrees: Doctor of Philosophy.

Repeatability: This course may be repeated for additional credit.

Pre-requisites: EPBI 9994|Minimum Grade of P|May not be taken concurrently.

EPBI 9999. Dissertation Research. 1 to 6 Credit Hour.
This course is limited to Ph.D. candidates who have completed and defended a dissertation proposal that is filed with the Graduate School by the last day to add a course in the semester. Continuous registration in 9999 fall and spring is required until the dissertation is successfully defended.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.
Student Attribute Restrictions: Must be enrolled in one of the following Student Attributes: Dissertation Writing Student.

Repeatability: This course may be repeated for additional credit.