

The School of Public Health

Through teaching and research, the Brown University School of Public Health trains future public health leaders, advances knowledge on pressing health challenges, and enhances population health and well-being for all. Our students *learn* public health by *doing* public health.

The School's mission is to improve the health of all populations, especially those most vulnerable, by producing world-class public health scholarship, forging strong community partnerships, and educating the next generation of diverse public health leaders. The School aims to achieve its mission by:

1. Rigorously preparing the next generation of diverse public health leaders, from undergraduates through postdoctoral fellows, to address the health needs of all people, including those of historically underserved or vulnerable populations
2. Generating world-class public health scholarship that addresses the health needs of all people, including historically underserved or vulnerable populations
3. Cultivating strong partnerships with communities and governmental entities in order to address the health needs of all people, including historically underserved or vulnerable populations
4. Ensuring that the School's infrastructure supports operational effectiveness, through enhanced philanthropy, improved financial practice, and expanded physical space

The School's values of Excellence, Equity, Diversity and Inclusion, Collaboration, Innovation, and Community Focus are critical to preserving and enhancing the health and well-being of humanity. Learn more about the School's Mission, Vision, & Values (<https://www.brown.edu/academics/public-health/about/mission-values/#:~:text=School%20Mission,of%20diverse%20public%20health%20leaders>).

Accredited by the Council on Education for Public Health (CEPH) in 2016, the School offers programs in the following degrees: Master of Public Health (MPH); PhD in Behavioral and Social Health Sciences; AM, ScM and PhD in Biostatistics; ScM and the Certificate in Clinical and Translational Research; PhD in Epidemiology; and PhD in Health Services Research. The School of Public Health offers two undergraduate concentrations: AB in Public Health and ScB in Statistics.

The School's small size and low student-to-faculty ratio translates to personal attention. From assistance in selecting coursework to advice on submitting grant proposals, faculty advisors in the School of Public Health work closely with students as they move through their studies.

For additional information regarding the School of Public Health and its programs of study and areas of research visit: brown.edu/academics/public-health/about (<http://brown.edu/academics/public-health/about/>)

Public Health Concentration Requirements

Public Health is an interdisciplinary concentration through which students examine a variety of health issues, including population health and disease, health policy, cross-cultural and international aspects of health, the organizational and social structures through which health services are delivered and received, and the public health system. Courses in the concentration allow students to explore the ways in which the social, political, behavioral and biological sciences contribute to the understanding of patterns of population distributions of health and disease. The concentration also provides students with courses in basic research methods and statistics necessary for problem solving and critical thinking in the emerging emphasis on evidence-based health care and public health.

Requirements for the Public Health Concentration

1. Core Courses (non-substitutable; 5 required for all students)

PHP 0310	Health Care in the United States	1
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PHP 0320	Introduction to Public Health	1
PHP 0850	Fundamentals of Epidemiology	1
PHP 1501	Essentials of Data Analysis	1
or PHP 1510	Principles of Biostatistics and Data Analysis	
PHP 1910	Public Health Senior Seminar (required of all non-honors seniors; FALL)	1
or PHP 1915	Public Health Honors Senior Seminar	
2. Environmental Health and Policy (select one of the following):		1
PHP 0720	Public Health and the Environment	
PHP 1101	World of Food: Personal to Global Perspectives on Nutrition, Agriculture and Policy	
PHP 1700	Current Topics in Environmental Health	
PHP 1720	Environmental Exposure Assessments in Practice (Rural Public Health)	
PHP 1725	Rural Public Health	
PHP 1730	Climate Risks and Health Solutions	
3. Health, Health Care Systems, and Policy (select one of the following):		1
PHP 0330	Public Health Policy	
PHP 0650	From Manufacturer to Patient: Why is the Cost of Prescription Drugs So Darn High?	
PHP 1100	Comparative Health Care Systems	
PHP 1450	COVID-19, Public Health, and Health Policy	
PHP 1460	Public Health in a Changing World: Law, Policy & Justice (I)	
PHP 1480	Introduction To Public Health Economics	
PHP 1681	Reproductive Health, Rights and Justice	
4. Social and Behavioral Science for Prevention (select one of the following):		1
PHP 0400	Intro. to Health Disparities & Making Connection btw Structure, Social Determinants&Health Equity	
PHP 0700	Global Public Health Interventions	
PHP 1101	World of Food: Personal to Global Perspectives on Nutrition, Agriculture and Policy	
PHP 1300	Parenting Behaviors and Child Health	
PHP 1551	Substance Use Prevention, Treatment, & Policy	
PHP 1610	Tobacco, Disease and the Industry: cigs, e-cigs and more	
PHP 1650	Race, Racism and Health	
PHP 1670	Public Mental Health: A Framework for Studying and Preventing Mental Disorders	
PHP 1680U	Intersectionality and Health Inequities	
PHP 1690	Technology and Health Behavior Change	
PHP 1920	Social Determinants of Health	
5. Global Health Elective (select one of the following):		1
PHP 0700	Global Public Health Interventions	
PHP 0720	Public Health and the Environment	
PHP 1070	Global Burden of Disease	
PHP 1802S	Human Security and Humanitarian Response: Increasing Effectiveness and Accountability	
6. Health Disparities Elective (select one of the following):		1
PHP 0400	Intro. to Health Disparities & Making Connection btw Structure, Social Determinants&Health Equity	

PHP 1460	Public Health in a Changing World: Law, Policy & Justice
PHP 1650	Race, Racism and Health
PHP 1680I	Pathology to Power: Disability, Health and Community
PHP 1680U	Intersectionality and Health Inequities
PHP 1681	Reproductive Health, Rights and Justice
PHP 1810	Community-Engaged Research in Public Health
PHP 1821	Incarceration, Disparities, and Health
PHP 1822	Effective Health Communication With Medically Underserved Populations in an Applied Learning Setting
PHP 1920	Social Determinants of Health

7. Biology (select one of the following): 1

BIOL 0200	The Foundation of Living Systems
BIOL 0380	The Ecology and Evolution of Infectious Disease
BIOL 0420	Principles of Ecology
BIOL 0470	Genetics
BIOL 0500	Cell and Molecular Biology
BIOL 0510	Introductory Microbiology
BIOL 0530	Principles of Immunology
BIOL 0800	Principles of Physiology

8. Public Health Elective (select any one PHP course OR one of the following Humanities/Fine Arts/Humanistic Social Sciences for Public Health courses) 1

AFRI 0550	African American Health Activism from Emancipation to AIDS
AFRI 1060W	Policy, Culture and Discourse that Shape Health and Access to Healthcare
AFRI 1060Z	Race, Sexuality, and Mental Disability History (HMAN 1973A)
AFRI 1920	Health Inequality in Historical Perspective
AMST 1600C	The Anti-Trafficking Savior Complex: Saints, Sinners, and Modern-Day Slavery
AMST 1601	Health and Healing in American History (STS 1110, GNSS 1960B)
COLT 0610Y	Women's Writing in the Arab World
COLT 1810P	Literature and Medicine
COST 0032	Music and Meditation
COST 0100	Introduction to Contemplative Studies
ENGL 1030C	Writing Science
ENGL 1050R	Writing about Health and Healthcare
ENGL 1140D	Writing Diversity: A Workshop
ETHN 1750B	Treaty Rights and Food Fights: Eating Local in Indian Country
GNSS 0090C	Reproductive Health: Science, Politics, and the Media
GNSS 0120	Introduction to Gender and Sexuality Studies
GNSS 1300	Gender-Based Violence Prevention
HISP 0490A	Spanish for Health Care Workers
HISP 0750Q	Health, Illness and Medicine in Spanish and Spanish American Literature and Film
HIST 0150H	Foods and Drugs in History
HIST 0270B	From the Columbian Exchange to Climate Change: Modern Global Environmental History
HIST 0286A	History of Medicine I: Medical Traditions in the Old World Before 1700

HIST 0286B	History of Medicine II: The Development of Scientific Medicine in Europe and the World
HIST 0537B	Tropical Delights: Imagining Brazil in History and Culture
HIST 1080	Humanitarianism and Conflict in Africa
HIST 1830M	From Medieval Bedlam to Prozac Nation: Intimate Histories of Psychiatry and Self
HIST 1960Q	Medicine and Public Health in Africa
HIST 1977I	Gender, Race, and Medicine in the Americas
HMAN 1975G	Planning the Family: Gender, Reproduction, and the Politics of Choice.
LACA 1503V	Health of Hispaniola
LITR 1151T	Poetry for Healing Territories
PHIL 0060	Modern Science and Human Values
PHIL 0520	Global Justice
SAST 0700B	Introduction to Modern South Asia: Public Health From Theory to Practice
TAPS 1281W	Arts and Health: Theory
TAPS 1281Z	Arts and Health: Practice

Total Credits 12**Honors:****Honors Track, Classes of 2023 & Beyond**

For Classes of 2023 & beyond, Honors track students enroll in PHP 1915, Public Health Honors Senior Seminar during Fall semester of their senior year as well as PHP 1980, Honors Thesis Prep during both semesters of their senior year to conduct research and write the honors thesis. Thus, for Classes of 2023 & beyond, fourteen courses are required for completion of the concentration requirements for an honors track student.

Please visit <https://www.brown.edu/academics/public-health/undergraduate/curriculum> (<https://www.brown.edu/academics/public-health/undergraduate/curriculum/>) for details or email the Director of Undergraduate Studies, Patricia Risica (patricia_risica@brown.edu) for more information.

Study Abroad/Study Away: The best semester to travel abroad/away is Spring of junior year. Courses taken away/abroad will likely NOT count for any of the concentration requirements, however, students can petition to have a course considered. Most do not meet the requirements or do not provide the ability for requirements to be assessed. Meet with concentration advisor and be prepared to provide syllabi for courses being considered for transfer (up to 2 per semester). Permission from concentration advisor is required.

Statistics Concentration Requirements

The Bachelor of Science degree in Statistics is designed to provide foundations that include basic statistical concepts and methodologies, and to expose students to the role of statistical thinking and analysis in interdisciplinary research and in the public sphere. To ensure deep rigorous understanding of the foundations and main methods of analysis in statistics, the program is composed of three parts: a) foundations in mathematics and computing, combined with an introduction to statistical thinking and practice; b) four core courses on the fundamentals of statistical theory and data analysis; and c) more advanced material covering important areas of statistical methodology. A capstone project involving substantial data analysis or focused on methodology/theory is required. Students also have opportunities to acquire practical experience in study design, data management, and statistical analysis by working as undergraduate research assistants in projects in one of the participating academic departments or Research Centers at Brown.

The Concentration is based on several premises: that statistics is a scientific discipline in its own right, with specialized methodologies and body of knowledge; that it is essentially concerned with the art and science of data analysis; and that it is best taught in conjunction with specific, substantive applications. To this end, the Concentration is

designed to provide foundations that include basic statistical concepts and methodologies, and to expose students to the role of statistical thinking and analysis in interdisciplinary research and in the public sphere. The Concentration prepares students for careers in industry and government, for graduate study in statistics or biostatistics and other sciences, as well as for professional study in law, medicine, business, or public administration. The undergraduate concentration guide is available here (<https://www.brown.edu/academics/public-health/biostatistics/undergraduate-statistics-concentration/>).

The Undergraduate Concentration in Statistics is administered by the Department of Biostatistics and leads to a Sc.B. degree. To ensure deep rigorous understanding of the foundations and main methods of analysis in statistics, the program is composed of three parts. The first part entails foundations in mathematics and computing, combined with an introduction to statistical thinking and practice. The second part includes four core courses that provide a comprehensive account of the fundamentals of statistical theory and data analysis. The third part delves into more advanced material covering important areas of statistical methodology. In addition to the formal coursework, students are required to complete a capstone project that involves a substantial data analysis or a methodological/theoretical project. Students also have opportunities to acquire practical experience in study design, data management, and statistical analysis by working as undergraduate research assistants in projects in one of the participating academic Departments or Research Centers at Brown.

The program requires **thirteen** one-semester courses. The required courses are as follows:

LEVEL I: Foundations in Mathematics - Calculus	2
MATH 0100 Single Variable Calculus, Part II	
MATH 0180 Multivariable Calculus	
LEVEL I - Foundations in Mathematics - Linear Algebra	1
MATH 0520 Linear Algebra	
Computing	1
APMA 0160 Introduction to Scientific Computing	
or CSCI 0040 Introduction to Scientific Computing and Problem Solving	
Introduction to Statistical Thinking and Practice	1
PHP 1501 Essentials of Data Analysis	
With the approval of the Director of the Statistics Concentration, one of the following courses may serve as replacement:	
SOC 1100 Introductory Statistics for Social Research	
ECON 1620 Introduction to Econometrics	
APMA 0650 Essential Statistics	
BIOL 0495 Statistical Analysis of Biological Data	
CLPS 0900 Statistical Methods	
LEVEL II - Core Courses in Theory and Data Analysis	2
APMA 1650 Statistical Inference I	
or APMA 1655 Honors Statistical Inference I	
APMA 1660 Statistical Inference II	
OR	
MATH 1210 Probability	
MATH 1620 Mathematical Statistics	
Introduction to Biostatistics	1
PHP 1510 Principles of Biostatistics and Data Analysis	
OR	
PHP 2510 Principles of Biostatistics and Data Analysis	
LEVEL III: Advanced Courses in Statistical Methods	2
PHP 1560 Statistical Programming in R	
OR	
PHP 2560 Statistical Programming with R	

AND	
PHP 1511 Applied Regression Analysis	
OR	
PHP 2511 Applied Regression Analysis	
Capstone Project	1
PHP 1970 Independent Study	
Electives in Social Science and Biostatistics (Students must choose 2)	2
SOC 1120 Market and Social Surveys	
SOC 1340 Principles and Methods of Geographic Information Systems	
SOC 2230 Techniques of Demographic Analysis	
CSCI 1420 Machine Learning	
CSCI 1810 Computational Molecular Biology	
CSCI 1820 Algorithmic Foundations of Computational Biology	
CSCI 1951A Data Science	
PHP 0850 Fundamentals of Epidemiology	
PHP 2030 Clinical Trials Methodology	
PHP 2120 Introduction to Methods in Epidemiologic Research	
PHP 2200 Intermediate Methods in Epidemiologic Research	
PHP 2515 Fundamentals of Probability and Statistical Inference	
PHP 2520 Statistical Inference I	
PHP 2530 Bayesian Statistical Methods	
PHP 2550 Practical Data Analysis	
PHP 2580 Statistical Inference II	
PHP 2602 Analysis of Lifetime Data	
PHP 2601 Linear Models	
PHP 2610 Causal Inference and Missing Data	
PHP 2620 Statistical Methods in Bioinformatics, I	
APMA 1070 Quantitative Models of Biological Systems	
APMA 1080 Inference in Genomics and Molecular Biology	
APMA 1200 Operations Research: Probabilistic Models	
APMA 1690 Computational Probability and Statistics	
APMA 1710 Information Theory	
APMA 1740 Recent Applications of Probability and Statistics	
APMA 1860 Graphs and Networks	
APMA 2610 Recent Applications of Probability and Statistics	
ENGN 2520 Pattern Recognition and Machine Learning	
CLPS 1292 Introduction to Programming for the Mind, Brain and Behavior	
CLPS 1492 Computational Cognitive Neuroscience	
ECON 1360 Health Economics	
ECON 1630 Mathematical Econometrics I	
ECON 1640 Mathematical Econometrics II	
ECON 1660 Big Data	
MATH 1810A Applied Algebraic Topology	
Other Analytical/Computational/ Statistical courses with the approval of the Director of the Statistics Concentration	
Total Credits	13

Prospective students will be able to obtain Advanced Placement credit for the requirements in mathematics. Students who have already completed an introductory course in statistics will be granted permission to proceed

to Level II core courses if they meet the prerequisites in mathematics and computing.

PHP 0100: As part of the capstone course or thesis, students should complete an online course, PHP 0100, at their own pace. This course is a requirement and is meant to give a broad overview of public health and it allows students to see different areas in public health where statistics is being used. The course does not require any additional credit and is completed as part of the independent study, PHP 1970/1980. Students who are in a double concentration in public health are exempt from this course.

Senior Thesis: A senior honors thesis is not a requirement for graduation, but concentrators who choose to write one are required to write a manuscript that describes a major project of statistical data analysis that they performed or a simulation study to evaluate the performance of a statistical method. Students that decide to write an honor thesis will generally integrate their capstone project into their thesis. Generally, writing a senior thesis includes two semesters of independent study (PHP 1980), the capstone project may serve as one of those.

Honors: Statistics requires the completion of a senior thesis and a superior record in the program.

Study Abroad/Study Away: Up to two courses taken elsewhere (study abroad or other transfer) may be applied to required courses. Meet with a concentration adviser to discuss; provide a syllabus for each course to be considered for transfer to your concentration plan.

The program is administered by the Department of Biostatistics, located at 121 South Main Street, 7th floor.

For additional information please contact: Roe Gutman, Box G-S-121-7; Telephone: 401-863-2682; Fax: 401-863-9182; e-mail: [Roe Gutman \(rgutman@stat.brown.edu\)](mailto:rgutman@stat.brown.edu)

Master of Public Health Graduate Program

The Brown MPH has a singular purpose: to train leaders in public health who are armed with the skills to conduct research, bring about policy change, and positively affect the health of populations. The program includes an internship, a thesis or a capstone, and the option of customizing your MPH with one of several concentrations.

The MPH Program has a 12 course credit requirement (11 standard courses and 2 half courses). In addition to the core courses listed below (4 standard and 2 half courses), MPH students must complete 5 concentration courses and 2 general MPH electives. For further information on program curriculum, please visit: <https://mph.sph.brown.edu/curriculum>.

MPH Program Core Course Requirements

MPH Core Course Requirements

Students must complete one of the following Data Analysis course sequences:

Sequence 1:

PHP 2507	Biostatistics and Applied Data Analysis I
PHP 2508	BioStatistics and Data Analysis II

Sequence 2:

PHP 2510	Principles of Biostatistics and Data Analysis
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PHP 2511	Applied Regression Analysis
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Sequence 3:

PHP 2506	Biostatistics for Public Health Research
PHP 2060	Qualitative Methods in Health Research
PHP 2061	Qualitative Data Analysis in Public Health Research (MPH students following the PHP2506/2060 sequence must also take PHP2061 as either an elective or concentration course)

Students must complete one of the following Epidemiology courses:

PHP 2120	Introduction to Methods in Epidemiologic Research
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PHP 2150	Foundations in Modern Epidemiologic Methods
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PHP 2140	Principles of Applied Epidemiology
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Students must complete the following course:

PHP 2355	Designing and Evaluating Public Health Interventions
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Students must complete the following two half credit courses:

PHP 2071	Applied Public Health: Systems and Practice
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PHP 2072	Applied Public Health: Policy, leadership and communication
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A five-year integrated Undergraduate/MPH (UG/MPH) program is also offered. This rigorous program in professional public health education is open to Brown undergraduates in any concentration. Students accepted into the program will complete the degree requirements for both their undergraduate degree and an MPH degree in a five-year period. Students must take 12 total course credits toward the MPH (5.5 during their first four years and 6.5 courses in the fifth year). For more information, please visit: <https://mph.sph.brown.edu/dual-degrees/ugmph>.

Dual Degree Program: Master of Public Health (MPH) and Master of Public Affairs (MPA)

The School of Public Health and the Watson Institute for International and Public Affairs offer a dual-degree Master of Public Health (MPH) and Master of Public Affairs (MPA) program. Emphasizing a learning by doing approach, this rigorous program will offer highly qualified applicants the opportunity to gain training in public health and public policy to prepare them to address the critical health policy issues in the United States and throughout the world. The dual degree program starts in summer and includes 17 course credits (14 full courses and 6 half courses) as well as an internship and a master's thesis. Students will benefit from the rich academic resources at the Watson Institute and the School of Public Health, as well as their extensive applied learning programs in Rhode Island, as well as throughout the United States and the world.

Program and admissions information can be found here: <https://mph.sph.brown.edu/dual-degrees/mphmpa>

Master of Public Health (Generalist) Graduate Program

The goal of the Master of Public Health (generalist) is to equip the next generation of public health leaders with the data analysis capabilities, public health knowledge and leadership skills to tackle the global health challenges of our time. To empower more people who can help meet those challenges, we've reimagined our generalist master's in public health degree as a 100% online master's in public health program. The online MPH degree program is designed for working professionals throughout the United States and internationally.

The Master of Public Health (generalist) program can be completed across 6 consecutive semesters and has a 12 course credit requirement.

GPHP 2000	Using Biostatistics to Make Public Health Decisions
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GPHP 2010	Using Epidemiology to Make Public Health Decisions
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GPHP 2020	Using Survey and Qualitative Methods to Make Public Health Decisions
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GPHP 2300	Social Determinants of Health/Equity in Public Health
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GPHP 2310	Interventions at the Local, National and Global Scale
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GPHP 2320	Evaluation of Public Health Programs
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GPHP 2400	Health Care Systems & Policy
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GPHP 2410	Comparative Health Care Systems
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GPHP 2800	Public Health Leadership and Practice
GPHP 2810	Local-Global Public Health Leadership
GPHP 2850	Public Health Communications
GPHP 2900	Integrative Learning Experience (ILE)

Accelerated Master of Public Health Graduate Program

The Accelerated MPH for Clinicians is a fast-paced, in-person program designed to deliver an academically rigorous and comprehensive public health education to professionals with prior medical or clinical healthcare education. The program is comprised of 10.5-units (i.e., the equivalent of 42 semester credits) that students can complete in one year (July – May), beginning with an online session in the summer. The curriculum will enable clinical professionals to achieve a deep and broad understanding of public health at a pace that complements their existing experience. Drawing on expertise from faculty within biostatistics, epidemiology, health services, policy and practice, and behavioral sciences, the Accelerated MPH program is designed to transform clinicians into experts in public health.

The following nine courses form the curriculum through which students will develop the program competencies:

Summer Course (online)

PHP 2073	Leadership and Communication (2 units)
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Fall Courses

PHP 2074	Needs Analysis and Program Planning (1.5 units including 80 hours of practicum)
PHP 2081	Health Policy and Equity
PHP 2120	Introduction to Methods in Epidemiologic Research
PHP 2506	Biostatistics for Public Health Research

Spring Courses

PHP 2030	Clinical Trials Methodology
PHP 2076	Integrated Learning Experience for Accelerated MPH Program
PHP 2727	Putting Research Into Practice with Implementation Science

Students must select one of the following two methods courses: PHP2040 or PHP2060

PHP 2040	Survey Research Methods
PHP 2060	Qualitative Methods in Health Research

For more information, please visit: <https://mph.sph.brown.edu/accelerated-mph>

Biostatistics Graduate Program

The graduate programs in Biostatistics offers comprehensive course work leading to a Master of Science (Sc.M.); a Master of Arts (A.M.) degree for students in the 5th-year Master's program and Brown's Open Graduate Education Program; and the Doctor of Philosophy (Ph.D.) degrees. The graduate programs in Biostatistics are designed to provide training in theory, methodology, and practice of statistics in biology, public health, and medical science. The programs provide comprehensive training in theory and methods of biostatistics, but is highly interdisciplinary and requires students to acquire expertise in a field of application. The Ph.D. program is intended to enable graduates to pursue independent programs of research.

Full details for the Biostatistics Doctoral Program can be found at <https://www.brown.edu/academics/public-health/biostats/academics/doctoral-program> (<https://www.brown.edu/academics/public-health/biostats/academics/doctoral-program/>).

The Sc.M. program provides training for application of advanced methodology in professional and academic settings. The Department of Biostatistics offers a 5th-Year Master's (<https://www.brown.edu/academics/public-health/biostats/academics/masters-program/5th-year/>) (A.M. degree) which is available to Brown Undergraduates. Required courses for the Biostatistics Master's degree program are listed

below. Additional details can be found on the Department's webpage: <https://www.brown.edu/academics/public-health/biostatistics/>

For more information on admission and program requirements, please visit <https://www.brown.edu/academics/public-health/admissions/> (<https://www.brown.edu/academics/public-health/admissions/>)

Required Courses

PHP 2515	Fundamentals of Probability and Statistical Inference (OR)	1
PHP 2520	Statistical Inference I	
PHP 2514	Applied Generalized Linear Models	1
PHP 2516	Applied Longitudinal Data Analysis	.5
PHP 2517	Applied Multilevel Data Analysis	.5
PHP 2550	Practical Data Analysis	1
PHP 2560	Statistical Programming with R	1
PHP 2610	Causal Inference and Missing Data	1
PHP 2650	Statistical Learning and Big Data	1

Electives (3 Courses)

PHP 2030	Clinical Trials Methodology	1
PHP 2530	Bayesian Statistical Methods	1
PHP 2580	Statistical Inference II	1
PHP 2601	Linear Models	1
PHP 2602	Analysis of Lifetime Data	1
PHP 2605	Generalized Linear Models	1
PHP 2620	Statistical Methods in Bioinformatics, I	1
PHP 2980	Graduate Independent Study and Thesis Research	1-5
PHP 2120	Introduction to Methods in Epidemiologic Research	1
PHP 2561	Methods in Informatics and Data Science for Health	1
CSCI 1420	Machine Learning	1
CSCI 1470	Deep Learning	1
CSCI 1570	Design and Analysis of Algorithms	1
CSCI 1810	Computational Molecular Biology	1

Biostatistics (Health Data Science) Graduate Program

The online Master of Science in Biostatistics (Sc.M.), Health Data Science track, provides students with a strong foundation in biostatistical, health data science methods and rigorous training in applied skills to meet the growing demands of this industry and become future leaders in the life science and public health domains. This program is offered 100% online and designed to serve a broad and diverse audience of learners to meet the pressing need for well-trained biostatistics professionals, both domestically and internationally.

The online Sc.M. in Biostatistics, Health Data Science track can be completed across 5 consecutive semesters and has a 9 course credit requirement.

BHDS 2000: Probability and Statistical Inference
BHDS 2010: Statistical Programming for Health Data Science
BHDS 2110: Methods I: Linear and Generalized Linear Models
BHDS 2020: Design of Observational and Experimental Studies
BHDS 2120: Methods II: Extensions to Regression
BHDS 2030: Causal Inference
BHDS 2130: Methods III: Statistical Machine Learning
BHDS 2040: Advanced Topics in Health Data Science
BHDS 2050: Problem-driven Biostatistics and Capstone Project

Behavioral and Social Health Sciences Graduate Program

The Doctor of Philosophy (Ph.D.) program in Behavioral and Social Health Sciences is an interdisciplinary graduate program that trains graduate students who are interested in (a) analyzing the complex behavioral and social determinants of public health, (b) developing interventions to change behaviors and improve social contexts related to public health, and (c) employing behavioral and social science theory and methods to understand contemporary health problems and to develop interventions that improve the health of individuals and populations. The program puts substantive focus on diet, physical activity and obesity; alcohol/drug use and misuse; smoking/tobacco use and misuse; HIV and sexual health risk behaviors; chronic disease prevention and management; global health; LGBTQI+ health; mindfulness in health; and health disparities and culture.

For more information on admission and program requirements, please visit:

<http://www.brown.edu/academics/gradschool/programs/behavioral-and-social-health-sciences> (<http://www.brown.edu/academics/gradschool/programs/behavioral-and-social-health-sciences/>)

Clinical and Translational Research Graduate Program

The Master of Science in Clinical and Translational Research (CTR) is designed primarily for physicians, doctorally-trained basic scientists, and students in doctoral programs or medical school. The goal of the Master's in Clinical and Translational Research Program is to train clinicians and basic scientists to extend basic scientific research into the clinical arena, ultimately leading to improvements in individual and population health. By translating basic research into improved clinical outcomes, researchers and clinicians are able to provide new treatments to patients more efficiently and quickly.

Full details on the Master of Science in Clinical and Translational Research, including the most up to date list of course requirements, can be found at <https://www.brown.edu/academics/public-health/ctr/masters>

Note:

Starting in fall 2022, Brown will admit no new students to the ScM CTR program. The program will remain open until all enrolled students have graduated or completed their maximum time to graduate (i.e., five years from initial enrollment if enrolled full time). As with all degree programs at the Brown School of Public Health, the CTR ScM program is accredited by CEPH. The program will retain its accredited status.

Master's in CTR Requirements

Master's in CTR Requirements

Intro to Research Methods (Students must complete one of the following two courses)

PHP 2120 Introduction to Methods in Epidemiologic Research

PHP 2150 Foundations in Modern Epidemiologic Methods

Biostatistics and Applied Data Analysis (Students must complete one of the following 2 courses sequences)

Sequence 1:

PHP 2507 Biostatistics and Applied Data Analysis I

PHP 2508 BioStatistics and Data Analysis II

Or

Sequence 2:

PHP 2510 Principles of Biostatistics and Data Analysis

PHP 2511 Applied Regression Analysis

Advanced Research Methods (Students must complete two of the following courses)

PHP 1560 Statistical Programming in R

PHP 2030	Clinical Trials Methodology
PHP 2040	Survey Research Methods
PHP 2060	Qualitative Methods in Health Research
PHP 2180	Interpretation and Application of Epidemiology
PHP 2200	Intermediate Methods in Epidemiologic Research
PHP 2410E	Medicare: A Data Based Policy Examination
PHP 2415	Introduction to Evidence-based Medicine
PHP 2465A	Introduction to Health Decision Analysis
PHP 2561	Methods in Informatics and Data Science for Health

Scientific Writing (Students must complete the following course)

PHP 2090 Research Grant Writing for Public Health

Topics in CTR (Students must enroll in this half credit course two times to fulfill the one credit requirement)

PHP 2470 Topics in Clinical, Translational and Health Services Research

Students must complete two CTR electives found at <https://www.brown.edu/academics/public-health/education-training/masters/clinical-and-translational-research/scm-ctr-electives>

The Certificate in Clinical and Translational Research is designed for trainees who need a more structured and intensive experience than can be obtained from taking one or two courses as a special/non-degree student, but who do not need or are not in a position to pursue the full Master's Degree. Students in the Certificate Program in Clinical and Translational Research must complete four courses. Full details on the Certificate in CTR can be found at <https://www.brown.edu/academics/public-health/ctr/certificate>.

Note:

As of the Fall 2021 semester, Brown stopped admitting new students to the CTR certificate program. The program will remain open until all enrolled students complete it.

Certificate in CTR Course Requirements

Certificate in CTR Course Requirements

Research Methods (Students must complete one of the following courses)

PHP 2120 Introduction to Methods in Epidemiologic Research

PHP 2150 Foundations in Modern Epidemiologic Methods

PHP 2300 Research Methods in Behavioral Science

Biostatistics and Applied Data Analysis (Students must complete both of the following courses)

PHP 2507 Biostatistics and Applied Data Analysis I

PHP 2508 BioStatistics and Data Analysis II

Students must complete one elective from the list found at <https://www.brown.edu/academics/public-health/ctr/certificate>

Epidemiology Graduate Program

The graduate program in Epidemiology offers comprehensive course work leading to the Doctor of Philosophy (Ph.D.) degree. Using sophisticated study designs, statistical analyses, field investigations, and laboratory techniques, epidemiology students investigate the multiple causes of a disease, disease distribution (geographic, ecological, and social), methods of transmission, and measures for control and prevention.

For more information on admission and program requirements, please visit: <https://www.brown.edu/academics/public-health/epi/home> (<https://www.brown.edu/academics/public-health/epi/home/>)

Health Care Leadership Graduate Program Requirements for the Master of Science in Healthcare Leadership

The ScM in Healthcare Leadership is administered by the School for Professional Studies in Coordination with the School of Public Health in terms of instruction and academic requirements.

HCL 2010	Healthcare Policy: Yesterday, Today, and Tomorrow	1
HCL 2000	Strategic Planning and Value Creation in Integrated Healthcare	1
HCL 2020	Leadership and Workforce Development	1
HCL 2050	Info-Powr Patient Care: Electr. Health Records, Healthcare Info Techn. + Medical Information Systems	.5
HCL 2070	Healthcare Finance & Cost Accounting	1
HCL 2060	Quality Improvement and the Healthcare Learning Organization	.5
HCL 2080	The Critical Challenge: Capstone Project	1
HCL 2090	Leadership and Professional Development	.5
HCL 2100	Health Law	0.5
HCL 2110	Epidemiology and Biostatistics for Healthcare	0.5
HCL 2120	Health Economics: Jargon, Theory, and Analytical Methods	0.5
HCL 2130	Data Analytics	0.5
HCL 2140	Marketing for Health Care Transformation	.5
Total Credits		9

Health Services Research Graduate Program

The graduate program in Health Services Research offers comprehensive course work leading to the Doctor of Philosophy (Ph.D.) degree. The program seeks to develop scientists experienced in the use of state-of-the-art experimental and non-experimental research methods to investigate how people obtain access to health care, the components and impacts of health care costs, and what happens to patients as a result of care. Health services research aims to identify the most effective ways to organize, manage, finance, and deliver high quality care to benefit population health.

For more information on admission and program requirements, please visit: <https://www.brown.edu/graduateprograms/health-services-research-phd> (<https://www.brown.edu/graduateprograms/health-services-research-phd/>)

Courses

Generalist Public Health

GPHP 2000. Using Biostatistics to Make Public Health Decisions.

The objective of the three-course data sequence is for students to develop the knowledge, skills, and perspectives necessary to use data to make public health decisions.

These three data courses complement each other, but do not have to be taken in a specific order. In this course, students learn core principles and methods of biostatistics and data analysis as they apply to public health case studies/current real-world examples. This course focuses on statistical principles as well as the applied skills necessary to answer public health questions using data, including the following: data analysis, data interpretation and the presentation of results. This course is intended to teach students both the basic knowledge required to develop and interpret quantitative studies as well as the skills to conduct basic statistical analyses.

Fall GPHP2000 S01 18171 Arranged (C. Linkletter)

GPHP 2010. Using Epidemiology to Make Public Health Decisions.

The objective of the three-course sequence is for students to develop the knowledge, skills, and perspectives necessary to use data to make public health decisions. These three data courses complement each other, but do not have to be taken in a specific order. In this course, students learn core principles and methods of epidemiologic investigations as they apply to public health case studies/current real-world examples. This course focuses on epidemiological methods and principles of study design and data analysis through analyses and critiques of published epidemiological studies as well as hands-on practice through weekly exercises and assignments.

GPHP 2010A. Using Epidemiology to Make Public Health Decisions.

The objective of the three-course data sequence is for students to develop the knowledge, skills, and perspectives necessary to use data to make public health decisions. These three data courses complement each other, but do not have to be taken in a specific order. In this course, students learn core principles and methods of epidemiologic investigations as they apply to public health case studies/current real-world examples. This course focuses on epidemiological methods and principles of study design and data analysis through analyses and critiques of published epidemiological studies as well as hands-on practice through weekly exercises and assignments.

GPHP 2020. Using Survey and Qualitative Methods to Make Public Health Decisions.

The objective of the three-course sequence is for students to develop knowledge, skills and perspectives necessary to use data to make public health decisions. These three data courses complement each other, but do not have to be taken in a specific order. Students learn and apply the theory of sampling and survey methods and their application to case studies from the first two methods courses. Topics include: survey design and planning; principles of sampling and survey terminology; questionnaire construction; protection of human subjects; data collection (including interviewing and data coding procedures); and application, presentation, and evaluation of results. The students will also be introduced to qualitative approaches to data collection and analysis. Methods covered include: participant observation, key-informant interviews, focus groups, innovative data collection strategies, and non-obtrusive measures. Students will learn and develop skills in: qualitative data collection and management, interviewing, transcript analysis using computerized software, triangulation between qualitative and quantitative data, and report preparation for qualitative studies.

Fall GPHP2020 S01 18163 Arranged (C. Sammartino)

GPHP 2300. Social Determinants of Health/Equity in Public Health.

There is mounting support for a social determinants of health approach across the world, from global, sociopolitical commitment to within-country action. In this course, students will examine the inequitable conditions in which people are born, live, work and age and how these conditions are propelled by inequities in power, money, and resources. Students will analyze structural, political, economic factors as well as how resource distribution decisions made outside the health sector contribute to health inequities. In the course, students will also explore innovative ways to reduce health disparities and work toward achieving health equity.

Fall GPHP2300 S01 18165 Arranged (J. Nazareno)

GPHP 2310. Interventions at the Local, National and Global Scale.

In this course students will learn about the role of theory, evidence, community engagement, ethics, cultural values, and cultural practices in health promotion intervention design. The course will focus on identifying population needs, assets, and capacities to inform intervention design. The course will also discuss intervention strategies across multiple levels of the socio-ecological framework and intervention implementation at the local, national, and global levels.

GPHP 2320. Evaluation of Public Health Programs.

This course will focus on how public health programs and interventions are evaluated. Students will learn about frequently used methods and planning tools as well as basic principles of budget and resource management to apply them to the development of an evaluation plan. Part of the evaluation is also assessing the impact of structural, socioeconomic, political, and organizational processes on the development, adaptation, implementation, and evaluation of public health programs and interventions.

Fall GPHP2320 S01 18166 Arranged (M. Doshi)

GPHP 2400. Health Care Systems & Policy.

This course is designed to give students the skills and experiences they need to master understanding of health care systems, policy in public health, and systems thinking. Throughout the class, students will assess how the health care and public health infrastructures operate across multiple levels of government and the role of stakeholders, politics, and media in influencing public health-related policies. Building on skills related to leadership and communications, students will learn about policy design and implementation to improve the health status of populations.

Fall GPHP2400 S01 18170 Arranged (M. Harvey)

GPHP 2400A. Healthcare Systems & Policy.

This course is designed to give students the skills and experiences they need to master understanding of health care systems, policy in public health, and systems thinking. Throughout the class, students will assess how the health care and public health infrastructures operate across multiple levels of government and the role of stakeholders, politics, and media in influencing public health-related policies. Building on skills related to leadership and communications, students will learn about policy design and implementation to improve the health status of populations.

GPHP 2410. Comparative Health Care Systems.

This course utilizes a comparative analysis framework for students to gain an understanding of health care systems in various high-income, middle-income, and low-income countries and analyze public health challenges as well as opportunities/strengths at these varying levels of economic development. Students will compare the organization, structure and function of health care, public health, and regulatory systems across national and international settings.

GPHP 2800. Public Health Leadership and Practice.

Leadership & Practice is part of a two-semester sequence of courses designed for students to develop and refine leadership skills to transition to leadership and management roles. These two courses complement each other, but do not have to be taken in a specific order. A large focus of these two courses is on the role of the students as leaders in their own organizations or in those in which they hope to work in the future. The first part of this course will introduce key ethical frameworks and concepts relevant to leadership in public health. Students will learn to apply ethical principles of public health to core concepts of leadership, governance, and management as well as how to develop vision, strategy and change management. Students will develop strategic plans that identify stakeholders and incorporate metrics to align operational strategies, goals and overarching mission.

GPHP 2810. Local-Global Public Health Leadership.

Leadership in Public Health is a two-semester sequence of courses designed for students to develop and refine leadership skills to transition to leadership and management roles. These two courses complement each other, but do not have to be taken in a specific order. A large focus of these two courses is on the role of the students as leaders in their own organizations or in those in which they hope to work in the future. In this course, students will learn to apply negotiation and mediation skills to address organizational or community challenges, integrate perspectives from other sectors and/or professions to promote and advance population health, and develop a strategic plan to guide an organization through changes caused by public health issues. Other leadership tools and techniques include mediating organizational change with available resources and integrating innovative and creative strategies.

Fall GPHP2810 S01 18167 Arranged (K. Andes)

GPHP 2850. Public Health Communications.

Effective communication skills are needed by leaders in public health settings. Public Health Communications is designed for students to develop communication skills to prepare them for the breadth of issues related to public health challenges. Students will learn and apply various communication strategies for different audiences and sectors and how to communicate audience-appropriate public health content, both in writing and through oral presentation. Students will learn to develop a communications plan for multiple audiences that addresses misinformation and conflicting data. In addition, students will learn the importance of cultural competence in communicating public health content to decision makers and will develop a public health campaign that demonstrates the utilization of a cultural competency framework.

Fall GPHP2850 S01 18172 Arranged (S. Roberson)

GPHP 2900. Integrative Learning Experience (ILE).

For your culminating academic experience, students will produce a final paper project addressing a current, real-world public health challenge. Capitalizing on the global nature of the program, students will be asked to examine the problem as it relates to their geographical region. They will gather and highlight various forms of data on their locale, identify stakeholders, and propose how they would advise their local or regional health authority to address the challenge. Students will choose from a number of challenges. Those who select the same challenge will form a group, work in tandem, and share their region-specific lessons with each other under the supervision of a faculty member with expertise on the topic.

Fall GPHP2900 S01 18169 Arranged (H. Ziobrowski)

Healthcare Leadership**HCL 2000. Strategic Planning and Value Creation in Integrated Healthcare.**

In this course, participants explore the meaning of value creation in healthcare organizations—how it relates to high performance, how it varies and is measured in different healthcare segments, and how it is embodied in the structure and performance of their own organizations. A holistic High Performance Model of enterprise value creation is presented, including strategic planning, process improvement, and resource and organizational alignment. The model is discussed from the perspectives of a variety of healthcare organizations—with the goal of applying the model to create value for the participants' own organizations.

HCL 2010. Healthcare Policy: Yesterday, Today, and Tomorrow.

In this course, students appraise past and current political, legal, technological, and economic U.S. healthcare policy developments. Students critically examine the implementation of alternative methods of health services delivery and financing within multiple global healthcare systems. Participants question assumptions, think creatively, and consider integrated patient care solutions to prepare for change and new paradigms within the global healthcare sector.

HCL 2020. Leadership and Workforce Development.

In the rapidly changing healthcare landscape of today, leaders require critical leadership skills to guide their organizations. In this course, you will explore several essential leadership capabilities, specifically negotiation, conflict management, collaboration, team building, ethical challenges, work-force development and Diversity/Equity/Inclusion (DEI). You will have the opportunity to assess your personal leadership styles and build a robust plan for your personal, on-going leadership development.

HCL 2030. Data-Driven Decision Making: The Structure, Conduct, Review, and Evaluation of Research.

This course will provide an overview of the methods and applications of therapy economics, biostatistics and epidemiology in healthcare sector decision-making. Specific topics include: the application of therapy economics and economic evaluation to treatments, pharmacoconomics and technology assessment; the assessment and interpretation of published epidemiological studies; institutional oversight of epidemiological research programs; the four key steps of statistical analysis (identification of scientific programs or problems of interest, collection of the required data, analysis and summary of data, and generation of a conclusion).

HCL 2040. Navigating the Regulatory Maze.

This course explores the culture of decision making as well as the structure and role of key US and international regulatory bodies. Students explore how health care is regulated with an eye towards understanding how existing regulations improve quality, enhance access, and control cost. The topics of risk management, public health, and product/drug regulation are emphasized.

HCL 2050. Info-Powr Patient Care: Electr. Health Records, Healthcare Info Techn. + Medical Information Systems.

This course will provide an overview of the major aspects of information technology (IT) as they relate to both the causes of and the solutions to current problems in healthcare. Issues of standardization, integration, communication and patient engagement will be stressed, and the types of strategic planning for and governance of information systems will be explored. During the course students will be presented with real problems in the field of HIT and explore possible solutions.

HCL 2060. Quality Improvement and the Learning Organization.

In this course, students will explore quality improvement systems, principles, drivers, and other tools that maximize patient outcomes and help create a healthcare learning organization. Students will discover how quality improvement creates value, and how to ultimately evolve/grow cultures, including a "just" culture and a culture of learning within their organization. Students will also design and implement at least two rapid cycle tests of change within their organizations. The course will explore both technical challenges and adaptive challenges (the latter ultimately concerning how to creatively empower all employees to view daily improvement as a key part of job responsibilities).

Fall HCL2060 S01 18581 Arranged

(R. Peto)

HCL 2070. Healthcare Finance & Cost Accounting.

This course focuses on the area of financial management as applied to international health organizations. The course emphasizes the application of principles and concepts of international health financial management to global health providers that represent innovative new structures and organizations, such as Accountable Care Organizations (ACOs) that offer integrated patient care. Students will gain competencies in the application of financial analysis tools and techniques internationally and in the interpretation of data for sound decision-making through case assignments and a class project to analyze the financial results of high performing healthcare organizations serving global markets.

HCL 2080. The Critical Challenge: Capstone Project.

In this project, supervised by Executive Master of Healthcare Leadership (HCL) faculty, students identify a critical challenge within healthcare and then work collaboratively to integrate knowledge from various perspectives and healthcare sectors and to apply relevant skills to develop possible solutions to their challenge. Students draw upon knowledge and skills from coursework with particular emphasis on collaborating across healthcare sectors, considering ethical implications, communicating effectively and developing creative and viable solutions.

Upon completion of this project, students will be able to successfully integrate knowledge of healthcare policy, strategic planning, regulation, management, marketing, healthcare research, quality improvement, finance and information technology to address a critical challenge within healthcare. Project outcomes should prove applicable to professional practice. This course spans two semesters.

HCL 2090. Leadership and Professional Development.

The new leadership and professional development course supports 12 of our HCL leadership competencies. As a result of participating in this class, students will expand their knowledge of leadership theories, in particular adaptive leadership theory, strengthen the interpersonal skills associated with the effective use of authority and leadership and increase their awareness of their impact on others. They will be consistently challenged to apply this knowledge and skills to their work environment.

HCL 2100. Health Law.

This course explores the major legal frameworks that govern US healthcare at the state and federal levels with a focus on legal relationships among patients, providers, payers, and institutions. Students will examine how the law regulates these relationships through informed consent; malpractice litigation; fraud and abuse restrictions pertaining to in-kind payments for healthcare services, devices, and pharmaceuticals; and antitrust laws to curb anti-competitive practices in healthcare consolidation. In addition to exploring the role of law in regulating the healthcare system, students will consider broader biomedical ethical issues and legal principles in the delivery of healthcare, such as abortion, experimental treatments, human subject research, end-of-life decision-making, including refusal of treatment, physician-assisted suicide, and organ donation. This course will connect these topics to practical executive skills related to negotiation, evaluation of risk, & effective engagement of legal counsel at the leadership level.

HCL 2110. Epidemiology and Biostatistics for Healthcare.

This course will introduce the principles and methods of epidemiologic investigations and biostatistics as they apply to the healthcare context. We will illustrate the methods by which studies of the distribution and transmission of diseases in populations (including disease outbreaks and epidemics) can contribute to an understanding of etiologic factors and can help inform treatments. We will introduce various study designs, including randomized trials, cohort studies, and case-control studies. We will also introduce the building blocks of evidence-based medicine, i.e., systematic reviews and meta-analyses. Quantitative and analytic methods covered during the course include measures of morbidity and mortality, statistical concepts, and measures of diagnostic test accuracy and treatment effectiveness.

HCL 2120. Health Economics: Jargon, Theory, and Analytical Methods.

This course is intended to provide a basic foundation in the methods and application of health economics; the concepts, topics, cases, and exercises are intended for healthcare leaders delivering care, paying for and producing healthcare goods and services, as well as those regulating, managing, and overseeing the delivery of healthcare. This course provides a high-level overview, understanding, and working knowledge of economic principles and methods applied in the healthcare sector. Applications to real healthcare delivery and financing issues are emphasized throughout the course, with students gaining experience analyzing health policy decisions that arise from basic economic choices that must be made concerning the efficient and equitable production, allocation, and consumption of healthcare resources. Upon completion of this course, students will demonstrate a technical understanding of the theory, principles, and methods of health economics.

HCL 2130. Data Analytics.

This course will introduce the principles and methods of data analytics as they apply to the healthcare context. We will illustrate the methods by which big data can contribute to an understanding of the underlying problems and challenges confronting our healthcare system. We will also introduce a number of case studies illustrating how analytics can solve strategic and operational issues. Students will work in their teams to understand and solve the case studies.

HCL 2140. Marketing for Health Care Transformation.

In today's rapidly changing healthcare market, leaders require critical marketing skills to help them guide the transformation of their organizations. In this course, you will develop several essential marketing skills, specifically in customer listening, segmentation & positioning, branding, social media, pricing, and product innovation. This course is specifically designed to discuss marketing in the healthcare context with a mix of examples from payers, providers, and the life science spaces. You will have the opportunity to apply the newly acquired knowledge. Upon completion of this course, you will be able to leverage strategic marketing constructs and frameworks in daily healthcare leadership situations that will be critical for changing behaviors of different stakeholders within the healthcare environment. You will also be able to use these tools and frameworks to help you proactively identify and address gaps in Diversity, Equity & Inclusion (DEI).

HCL 2200. Digital Health Innovations and AI in Healthcare.

This course will provide an overview of the design, evaluation, and deployment of digital health innovations in the healthcare setting. This course will also cover key aspects of artificial intelligence (AI) that is increasingly poised to impact the practice and delivery of healthcare. Through examination of primary literature, students will gain insight to the promises and challenges of digital health and AI in clinical and public health contexts.

Public Health**PHP 0060. Complexities and Challenges of Global Health.**

Global health refers to the health and wellbeing of all of the world's populations, regardless of geography, country, or citizenship. Many of today's most pressing issues, from climate change to political conflict and population displacement, have profound implications for health. This course will introduce students to fundamental topics in global health, and it will encourage them to approach global health issues through a lens of equity and responsibility toward people and populations beyond United States' borders. Students will develop a framework for understanding contemporary health challenges and learn how responses to these complex problems require collaboration across health and non-health sectors of society. This course will challenge students' assumptions about world health while strengthening their skills in data literacy and critical analysis.

Fall	PHP0060	S01	17706	TTh	1:00-2:20(06)	(N. Trivedi)
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PHP 0300A. Pandemics and Global Epidemics.

This online summer-session course will provide an intensive introductory-level learning experience on several important pandemics and global epidemics throughout history. The course will begin by covering the basic biology of infectious diseases; the different ways infectious diseases can spread throughout populations; what makes an infectious agent successful; and how changes in population structure and rapid advancements in population movement impact infectious diseases. We will then review important pandemics and global epidemics throughout time, including the 1350 bubonic plague, 1918 Spanish flu pandemic, HIV/AIDS global epidemic, and the coronavirus outbreaks. We will examine the basic characteristics of each of these diseases, how they are believed to have spread to humans, how they spread globally, what prevention and control measures were implemented, and what was learned. The course will conclude with a discussion of the concept of "pandemic preparedness."

PHP 0300B. The Interplay Of Ethics, Politics, and Science in Public Health.

Vaccine requirements, taxation of soda and cigarettes, communication campaigns on healthy lifestyles – these public health interventions have saved lives. These different measures illustrate the range of approaches in public health, from laws that force individuals to take action to persuasive strategies to convince people to do so. These approaches also raise questions: When is it justifiable to employ coercion to achieve public health gains? Can persuasion be manipulative? What groups may be empowered, or marginalized, by these measures?

In this course, we will explore how scientific evidence, socio-political forces, and ethics intersect to frame public health issues, policies, and research. This course will help students develop analytical skills that can be employed to examine controversial topics and evaluate public health programs critically. These skills can be applied to varied contexts and settings, being foundational in students' professional and academic careers.

PHP 0310. Health Care in the United States.

Introduction to the health care delivery system. An overview of the U.S. health care financing, delivery and regulatory system. Considers the interaction between paying for and providing and assuring the quality of health services; changes in one component of the system inevitably affect the others. Addresses the balance between employer funded health insurance, publicly funded health insurance and the consequences of not being insured. Six discussion sections will be arranged. Open to undergraduates only. This is a core class for the concentration in public health.

Fall	PHP0310	S01	17561	MWF	10:00-10:50(14)	(I. Wilson)
Fall	PHP0310	C01	17562	M	9:00-9:50	'To Be Arranged'
Fall	PHP0310	C02	17563	W	9:00-9:50	'To Be Arranged'
Fall	PHP0310	C03	17564	F	9:00-9:50	'To Be Arranged'
Fall	PHP0310	C04	17565	M	11:00-11:50	'To Be Arranged'
Fall	PHP0310	C05	17566	W	11:00-11:50	'To Be Arranged'
Fall	PHP0310	C06	17567	F	11:00-11:50	'To Be Arranged'
Fall	PHP0310	C07	17568	M	12:00-12:50	'To Be Arranged'
Fall	PHP0310	C08	17569	W	12:00-12:50	'To Be Arranged'
Fall	PHP0310	C09	17570	F	12:00-12:50	'To Be Arranged'
Fall	PHP0310	C10	17571	M	12:00-12:50	'To Be Arranged'
Fall	PHP0310	C11	17572	W	12:00-12:50	'To Be Arranged'
Fall	PHP0310	C12	17573	F	12:00-12:50	'To Be Arranged'
Fall	PHP0310	C13	17574	T	10:30-11:20	'To Be Arranged'
Fall	PHP0310	C14	17575	Th	10:30-11:20	'To Be Arranged'
Fall	PHP0310	C15	17576	T	12:00-12:50	'To Be Arranged'
Fall	PHP0310	C16	17577	Th	12:00-12:50	'To Be Arranged'
Fall	PHP0310	C17	17578	T	1:00-1:50	'To Be Arranged'
Fall	PHP0310	C18	17579	Th	1:00-1:50	'To Be Arranged'

PHP 0320. Introduction to Public Health.

An introductory overview of the U.S. Public Health System with an emphasis on the core functions of public health, challenges and strategies for working with communities, and specific health issues that impact the health of the population. Presents a comprehensive overview of the environmental and behavior factors associated with health promotion and disease prevention.

PHP 0330. Public Health Policy.

PHP 0330 provides a comprehensive overview of the function, aims, methods, implementation, and evaluation of public health policy in the U.S. and globally. The course grounds public health policy within the broader framework of public policy, examining key legal, ethical, economic, and political issues, as well as issues grounded specifically in public health, paying particular attention to the tensions between policy and personal freedoms. PHP 0330 assumes that the pursuit of public health has two essential, conjoined goals: to reduce the burden of human disease and disability, and to eliminate health disparities, taking the position that health equity is a non-negotiable right and must be in the forefront of policy assessment, development, implementation, and evaluation. Although the course will focus on mature public health policy in the United States, it will do so within two broad perspectives, historical and global.

PHP 0400. Intro. to Health Disparities & Making Connection btw Structure, Social Determinants&Health Equity.

Course provides an introduction to the examination of health disparities in the U.S. Through assigned readings, lectures, guest speakers, and class discussions— this course will provide a broad overview of health disparities in the United States and examine them through intersecting structural and social determinants (e.g., race and ethnicity; gender; immigration status; socioeconomic position; age; sexual orientation; policy). This course also examines how stigma, residential segregation, implicit bias and the debates around genetics also contribute to health disparities. Lastly, we will also critically delve into the ethical dimensions, the role of social networks as well as behavioral health and public policy interventions. Community leaders will be invited to discuss their respective organizations, discuss ongoing community-university partnerships, advocacy, and networking.

PHP 0650. From Manufacturer to Patient: Why is the Cost of Prescription Drugs So Darn High?

In 2015, estimates of drug spend in the United States was about \$457 billion and could be as high as \$610 billion by 2021. The reasons for the continued escalating costs of prescription drugs are unclear. In this course we will examine the complex chain of discounts, rebates and markups that impact the price of a prescription drug from the manufacturer's list price to the time it is dispensed to the patient. We will examine the role of major stakeholders in the drug supply chain including the manufacturer, wholesalers and distributors, pharmacy benefit managers and health plans. PHP 0310, Healthcare in the United States, is a prerequisite. Students who feel they have adequate background and understanding of health insurance, Medicare and Medicaid and model of care delivery and financing but have not taken PHP 0310 should contact instructor for override. Students must have basic knowledge of terms associated with managed care and healthcare issues routinely written about or featured in the news.

PHP 0700. Global Public Health Interventions.

This is an introductory course designed to provide an overview of social and behavioral global health interventions. This course will introduce the history of global public health interventions and the philosophy of global public health including its core values, concepts, and functions. It will present an overview of design, implementation, and evaluation considerations for behavioral and social interventions in global settings with a particular focus on settings of resource scarcity. Furthermore, this course will focus on understanding the socio-economic, behavioral, biological, and other factors that impact human health and contribute to health disparities globally. To encourage participative learning, the class will collectively decide on 4-5 health topics to dive deeper into and apply knowledge learned at the beginning of the course to global health topics of interest.

PHP 0710. Introduction to Modern South Asia: Public Health From Theory to Practice (SAST 0700B).

Interested students must register for SAST 0700B.

PHP 0720. Public Health and the Environment.

This course approaches global public health through the lens of environmental determinants. We will examine our world's changing environment and its relationship to health with particular focus on environmental health challenges in low- and middle-income countries (LMICs). Students will explore important environmental issues that impact population health and apply public health perspectives to understanding determinants of disease and contextualizing and addressing global health challenges.

PHP 0850. Fundamentals of Epidemiology.

What is epidemiology? It is the study of the occurrence and distribution of health-related states and processes in specified populations and the application of this knowledge to control health problems. This course will provide learners with a strong foundation in the concepts and methods needed to describe the burden of a disease in communities, identify what causes these poor health outcomes, and evaluate the impacts of interventions meant to improve health.

Fall PHP0850 S01 17525 TTh 10:30-11:50(13) (W. Goedel)

PHP 1070. Global Burden of Disease.

This is an advanced introduction to global public health, defining and critically examining key topics and concepts through an interdisciplinary lens. From historical efforts in mid-20th century international health assistance, to the early 21st century explosion of global health funding, to current efforts to decolonize global health and engage in more equitable global partnerships, this course examines major social and scientific developments. Readings, lectures, in-class discussions and small groups explore changes in the underlying causes of morbidity and mortality during global social, economic and health transitions, the biological and social ecology of global disease patterns, and efforts to improve health in under-resourced settings. Guest lecturers offer different perspectives on the global burden of disease. An in-depth research paper worth 40% of the final grade is the scholarly centerpiece of course; this is a rigorous semester-long project. There are two exams.

Fall PHP1070 S01 18272 TTh 9:00-10:20(05) (A. Harrison)

PHP 1100. Comparative Health Care Systems.

Focuses on principles of national health system organization and cross-national comparative analysis. Emphasizes application of comparative models to the analysis of health and health-related systems among nations at varying levels of economic development and health care reform. Addresses research questions related to population health and systems' performance. Enrollment limited to 30.

PHP 1101. World of Food: Personal to Global Perspectives on Nutrition, Agriculture and Policy.

This course explores food and nutrition in the US and around the world through the lens of public health, economics, and agriculture. The hybrid setting requires students to engage in and learn about the local Providence community and their own community at home from perspectives likely not previously noticed. Students will read from many sources; will review documentary films; and will write for several audiences.

At the completion of this course, students will:

- Describe how nutrients are consumed through foods
- Explore food consumption in the US and abroad
- Describe US agricultural production techniques
- Propose policy changes to the current food system

PHP 1160. The Global Burden of Mental Illness: A Public Health Approach.

Provides an introduction to the classification, epidemiology, etiology, treatment and potential prevention of psychiatric disorders from a population perspective. Reviews the magnitude and social burden associated with mental disorders worldwide and opportunities to enhance prevention and treatment.

Covers concepts and methods used to study mental illness at the population level, including definitions of "normality" and "pathology", current classification systems and measurement approaches to assess psychopathology and severity and cross-cultural issues.

Covers the prevalence, risk factors, and etiology of major disorders of children, adolescents and adults, including autism spectrum disorders, attention deficit disorders, mood and anxiety disorders, schizophrenia and substance use disorders. PHP 0850 OR prior coursework in psychology, epidemiology, sociology or related fields.

PHP 1300. Parenting Behaviors and Child Health.

Parents play an integral role in developing, supporting, and managing children's health-related behaviors. We will examine how parenting influences child behaviors and health outcomes across development, from infancy through adolescence. We will explore parenting styles, knowledge, attitudes, and practices, including specific behaviors in various domains such as food parenting and sleep parenting. Using socio-ecological models and a community-engaged approach, we will investigate how sociodemographic characteristics, culture, family structure, the physical environment, and other contextual factors impact parenting and subsequently child health behaviors and outcomes. We will discuss of the unique experiences and stressors of diverse and/or non-traditional families including single parent households, families in poverty, LGBT families, and immigrant and/or racial/ethnic minorities. Finally, we will examine parenting as a modifiable intervention target to improve child health. Through it all, students will understand how parenting behaviors shape child health.

PHP 1400. HIV/AIDS in Africa: A Multidisciplinary Approach to Support HIV/AIDS Care and Treatment Programs.

The course is intended to challenge students from different disciplines to develop strategies to address the challenges of establishing and sustaining HIV/AIDS care and treatment programs in Africa. The course will begin with a general introduction to HIV/AIDS to provide a foundation wherein students will obtain a basic scientific and sociological understanding of the disease. Discussion topics on: the impact of AIDS, introducing antiretroviral therapy in Africa, monitoring and evaluating ARV therapy scale up and developing a country wide plan for a national laboratory system to support HIV/AIDS care and treatment will be facilitated through the use of case studies. Enrollment limited to 25 juniors and seniors. Graduate students with permission of instructor.

PHP 1450. COVID-19, Public Health, and Health Policy.

The impact of COVID-19 on US society has been profound. Caused by the newly emergent SAR-COV2 virus, the pandemic required public health practitioners and healthcare systems to pivot to keep the public safe under challenging circumstances. In the US, local municipalities, state governments, and the federal government developed varying, and at times conflicting, policies to guide the public health response. Using a case-study approach, this course will explore how public health and health policy intersected and clashed in responding to this 100-year pandemic. We will examine how different states and federal agencies responded to COVID-19 and learn from leaders directly involved in the pandemic response.

Fall	PHP1450	S01	17557	T	4:00-6:30(07)	(S. Rivkees)
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PHP 1460. Public Health in a Changing World: Law, Policy & Justice.

Laws and policies shape public health in profound ways. The U.S. Constitution frames and limits government authority to protect and promote public health. It also provides protections for individual rights that often are in tension with public health's focus on the common good. Federal, state and local laws and policies structure the distribution of society's resources and—as interpreted, implemented and enforced—can have serious implications for health equity. The COVID-19 pandemic has exposed deeply polarized views among Americans about the role of government in public health and has laid bare vast structural health inequities. This course will explore the Constitutional foundations of public health law; how public health powers are distributed across different levels and branches of government; legal and policy strategies for addressing infectious and chronic diseases and injuries; and the role of laws and policies in structuring—and remedying—health inequities.

Fall	PHP1460	S01	17999	TTh	9:00-10:20(05)	(L. Tobin-Tyler)
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PHP 1480. Introduction To Public Health Economics.

This course builds an understanding of the healthcare delivery and financing systems from a health economics perspective. It will draw examples that illustrate the production of and demand for health, healthcare, and health insurance. The goals of the course are twofold. First, it will provide the basic intuition of the fundamental economic models such as health production, demand for healthcare and demand for insurance. Second, it will introduce key empirical findings in the public health economics literature. Emphasis will be placed on key theoretical insights as well as practical and public health policy implications.

PHP 1501. Essentials of Data Analysis.

This course covers the basic concepts of statistics and the statistical methods commonly used in the social sciences and public health with an emphasis on applications to real data. The first half of the course introduces descriptive statistics and the inferential statistical methods of confidence intervals and significance tests. The second half introduces bivariate and multivariate methods, emphasizing contingency table analysis, regression, and analysis of variance. This is designed to be a first course in Statistics. The course is intended for Public Health or Statistics concentrators. Others can register with instructor's permission. There are no prerequisites.

Fall	PHP1501	S01	17526	TTh	1:00-2:20(06)	(A. Murillo)
Fall	PHP1501	S02	17527	MW	8:30-9:50(09)	(A. Murillo)
Fall	PHP1501	L01	17528	T	9:00-10:20	(A. Murillo)
Fall	PHP1501	L02	17529	W	10:00-11:20	(A. Murillo)
Fall	PHP1501	L03	17530	Th	9:00-10:20	(A. Murillo)
Fall	PHP1501	L04	17531	F	10:00-11:20	(A. Murillo)

PHP 1510. Principles of Biostatistics and Data Analysis.

This course is the first in a two-part sequence (the sequel being PHP 1511: Applied Regression Analysis), designed to provide students with a broad-based exposure to modern methods and applications of probability and biostatistical inference. It is geared toward students concentrating in statistics and other students who desire a course that combines the mathematical underpinnings of statistical methods with timely applications in the biological, life and health sciences and related fields. Applications to real data from a variety of studies are used throughout the course to illustrate the materials, but the emphasis is on the principles of inference and the underlying theory. This course will also give students experience manipulating and analyzing data using the R statistical software package with RStudio interface. Students will work with statistical software during the homework assignments, but this is not a course in R.

Fall	PHP1510	S01	17558	TTh	10:30-11:50(13)	(C. Schmid)
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Fall	PHP1510	L01	18676	M	12:00-12:50	(C. Schmid)
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Fall	PHP1510	L02	18677	W	12:00-12:50	(C. Schmid)
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Fall	PHP1510	L03	18678	F	12:00-12:50	(C. Schmid)
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PHP 1511. Applied Regression Analysis.

This course provides a survey of regression techniques for outcomes common in public health data including continuous, binary, count and survival data. Emphasis is on developing a conceptual understanding of the application of these techniques to solving problems, rather than to the numerical details. Extensive use of the computer will be made for analysis of datasets.

PHP 1540. Alcohol Use and Misuse.

Reviews the epidemiology of alcohol use, abuse, and dependence and examines its neurobiological and behavioral underpinnings. Covers etiology including physiological, genetic, psychological and social cultural influences, and prevention, brief intervention and treatment considerations. Course background in psychology, sociology, or public health is recommended. Recommended prerequisites: PHP 0320 and CLPS 0010. Enrollment limited to 20 juniors, seniors, and graduate students.

PHP 1550. Substance Use and Vulnerability to Addiction.

This foundational course will examine how we classify substance use, substance misuse, and substance use disorders and how substance use impacts population health, including exacerbating health disparities. We will examine and compare prominent models of why people become addicted to substances. Using the socioecological model as a framework, we will analyze key risk and protective factors for substance misuse including (a) individual factors such as biological susceptibility, personality, and co-occurring psychiatric disorders, (b) interpersonal factors such as peer use and social support, (c) community factors such as access to alternative reinforcers and neighborhood resources, and (d) societal factors such as racism, social and economic inequalities, and stigma around addiction. Using this framework, we will analyze how social determinants of health impact substance use and its negative consequences in marginalized populations.

Fall	PHP1550	S01	18281	W	3:00-5:30(10)	(R. Cassidy)
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PHP 1551. Substance Use Prevention, Treatment, & Policy.

This course will focus on the public health response to substance misuse and addiction. We will critically examine substance use-related policies, including evaluating their positive impacts as well as their potentially damaging consequences, particularly for racial and ethnic minority communities. We will discuss the key tenets of mutual help programs, behavioral treatments, and pharmacotherapies for addictions and discuss their efficacy, cost effectiveness, population reach, and capacities for addressing health inequities. Finally, we will discuss how a range of substance use prevention and harm reduction programs are developed and evaluate evidence for their effectiveness in the context of existing health inequities. Suggested prerequisites are one epidemiology course: PHP 0850, 2120, or 2150. Enrollment restricted to juniors, seniors and graduate students. Others with instructor permission. PHP1550 is recommended but not required.

PHP 1560. Statistical Programming in R.

Statistical computing is an essential part of analysis. Statisticians need not only be able to run existing computer software but understand how that software functions. Students will learn fundamental concepts - Data Management, Data types, Data cleaning and manipulation, databases, graphics, functions, loops, simulation and Markov Chain Monte Carlo through working with various statistical analysis. Students will learn to write code in an organized fashion with comments. This course will be taught in a "flipped" format. Students will watch a series of videos and work through some simple coding examples before coming to class.

Fall PHP1560 S01 18350 TTh 2:30-3:50(12) (A. Paul)

PHP 1600. Obesity in the 21st Century: Causes, Consequences and Countermeasures.

The scope of obesity knowledge is too large to cover during one single course, therefore we will focus primarily on obesity-related health outcomes, assessment of obesity, obesity epidemiology, social and behavioral correlates of obesity, obesity and stigma, policy and interventions across population groups. The readings for this course are multi-disciplinary in nature and integrate epidemiological, biological, sociological, political and philosophical perspectives. This course is specific to the United States and thusly all readings will reflect this contextual focus. Enrollment limited to 30.

PHP 1610. Tobacco, Disease and the Industry: cigs, e-cigs and more.

This class will help students gain knowledge about tobacco use and cigarette smoking, nicotine addiction, novel new products, and the tobacco industry. We will cover the link between smoking, disease, and death; smoking prevalence and nicotine dependence; novel products such as e-cigarettes and Modified Risk Tobacco Products; the role of the tobacco industry; behavioral and pharmacological smoking cessation treatments; community, organizational, and media campaigns; tobacco policy; and, global tobacco control. The course is designed as a seminar course emphasizing class discussion and debate, as well as in-depth discussion of the assigned readings. Suggested prerequisites PHP 0850, PHP 2120, or PHP 2150

PHP 1650. Race, Racism and Health.

The primary aim of this course is to expose students to state-of-the-science conceptual and methodological approaches to critically analyze and identify strategies to address racial and ethnic health disparities. A multidisciplinary approach using readings from disciplines such as sociology, medicine, and biology will be used to provide a foundation for examining scientific literature and conducting intervention research on racial and ethnic health disparities.

PHP 1670. Public Mental Health: A Framework for Studying and Preventing Mental Disorders.

This course provides a framework for studying and preventing mental disorders. Key concepts in public health and epidemiology will be applied to mental and behavioral health disorders including depressive, anxiety, and substance use disorders. Major topics of this course include: 1) classification systems for mental disorders, 2) public health surveillance of mental disorders, 3) the burden, epidemiology, and determinants of mental disorders, and 4) strategies for mental disorder treatment and prevention, with a focus on health policy.

PHP 1680I. Pathology to Power: Disability, Health and Community.

This course offers a comprehensive view of health and community concerns experienced by people with disabilities. Guest speakers, and hands on field research involving interactions with people with disabilities will facilitate the students gaining a multi-layered understanding of the issues faced by people with disabilities and their families.

Fall PHP1680I S01 17556 TTh 2:30-3:50(12) (S. Skeels)

PHP 1680U. Intersectionality and Health Inequities.

This interdisciplinary seminar course examines health inequities in the US using an intersectional lens. Intersectionality addresses how multiple power relations and systems of oppression impact the lived experiences of multiply marginalized groups in historical and social context. During this course, we will discuss the historical and theoretical underpinnings of intersectionality and its conceptual and methodological applications to public health. We will also examine how multiple forms of discrimination – including racism, sexism, classism, heterosexism, cisgenderism, xenophobia, and ableism – shape health inequities among diverse multiply marginalized groups in differential and compounding ways. This course will also address how multiply marginalized communities have resisted oppression and discrimination and promoted their own health and well-being through community organizing efforts and social movements. Finally, we will identify the implications of using an intersectional approach to addressing health inequities for research, policy, and practice.

PHP 1681. Reproductive Health, Rights and Justice.

This course will explore how reproductive health, healthcare and freedom are regulated in the United States. The course will apply an reproductive justice framework that investigates laws, policies and practices affecting reproductive rights and bodily autonomy, but that also applies an intersectional lens to consider how race, gender, sexuality, class, ability, and immigration status affect reproduction and parenting for marginalized communities. We will also explore how religion and ideas of morality shape laws, policies and practices implicating reproductive health, bodily autonomy and notions of reproductive justice. Topics will include: eugenics, sterilization, contraception, abortion, criminal fetal endangerment laws, substance use during pregnancy, reproductive rights of incarcerated populations, access to reproductive healthcare, assisted reproduction, surrogacy, maternal health disparities, the child welfare system, and policies related to parenting and family health. Readings will include public health, law and policy analysis and landmark legal opinions.

PHP 1690. Technology and Health Behavior Change.

Lifestyle behaviors like poor diet, low physical activity, drug/alcohol use, and poor medication use contribute to some of the top causes of morbidity and mortality globally, including heart disease, diabetes and many cancers. Changing these behaviors is difficult and requires substantial, long-term effort and commitment on the part of both patients and providers. This course is a survey of computing systems and technologies that are designed to help users make healthier choices. We will explore how and why these systems work, the theories behind them, and how to find/evaluate the evidence supporting them, using both popular industry products and more experimental programs as examples. Students interested in gaining hands-on experience with these technologies and learning more about the processes behind their features should take this course.

PHP 1700. Current Topics in Environmental Health.

This course is designed to introduce students to the field of environmental health, and demonstrate how environmental health is integrated into various aspects of our lives, both directly and indirectly. Topics to be covered include: toxic metals, vector-borne disease, food safety, water quality, radiation, pesticides, air quality, hazardous waste, risk assessment, and the role of the community in environmental health. Several topics will be presented by guest speakers so that students can learn from the expertise of professionals in the field. Enrollment limited to 65.

Fall PHP1700 S01 18523 F 1:00-3:30 (T. Zheng)

PHP 1710. Climate Change and Human Health.

Global climate change is occurring and these changes have the potential to profoundly influence human health. This course provides students with a broad overview of the diverse impacts of projected climate change on human health, including effects of changing temperatures, extreme weather events, infectious and non-infectious waterborne threats, vector-borne disease, air pollution, the physical and built environment and policies to promote mitigation and adaptation. Students will explore multiple sides of controversial issues through lively and informed class discussions, writing exercises, and participation in a series of end-of-term debates. Enrollment is limited to 20 students.

PHP 1720. Environmental Exposure Assessments in Practice.

Exposure assessments are the key to linking environmental contaminants to human health. This course will provide you with a detailed overview of environmental exposure assessment and its role in providing tools and metrics for defining exposures in epidemiological studies. This includes the design of community and personal monitoring studies, the techniques and equipment used for sampling and analysis, and the interpretation of data. Simultaneously, students will develop and carry out an environmental exposure assessment in the local community and will also learn about and put into practice topics such as community engagement, community surveying, environmental justice, and public health communication strategies.

Fall PHP1720 S01 17705 MW 8:30-9:50(09) (E. Walker)

PHP 1725. Rural Public Health.

This course will be anchored by a class research project, where together, we will work through a public health topic in real-time. The overarching goal of this class is to provide students with a solid basis for understanding public health issues in rural settings, and how to carryout, thoughtful, and impactful public health studies and environmental exposure assessments in rural communities. For the Spring 2024 semester, students enrolled at Brown University and Tougaloo College will develop a public health research project based in Gloster, Mississippi, a rural community of only 897 residents, grappling with pollution coming from one of the largest wood pellet manufacturing companies in the world. We will leverage a current and ongoing air pollution monitoring network and public health study to examine the relationship between air quality and community health.

PHP 1730. Climate Risks and Health Solutions.

Climate risks are no longer theoretical. This course provides students with a broad overview of the health consequences of climate change resulting from changing temperatures, extreme weather, air pollution, and water quality. The course will introduce students to practical solutions that both reduce greenhouse gas emissions and improve human health. These solutions include energy efficiency and decarbonization in buildings, electrifying transportation, changing food production, and engagement with healthcare organizations. Students will be exposed to a range of practitioners working to implement solutions in a variety of sectors and will gain practical skills needed to support the development of regulations, policy, and programs. Assignments will give students experience developing written materials and practicing oral skills to engage in climate policy work. Note that enrollment is limited to 20 students.

PHP 1802. Human Security and Humanitarian Response: Increasing Effectiveness and Accountability (IAPA 1802S)..

Interested students must register for IAPA 1802S.

Fall PHP1802 S01 18747 Arranged 'To Be Arranged'

PHP 1802S. Human Security and Humanitarian Response: Increasing Effectiveness and Accountability.

Disasters, natural and anthropogenic, pose significant threats to human security. Effective humanitarian action is important for both short and long-term responses to complex emergencies. The array of factors contributing to the economic and human losses experienced in both natural disasters and complex humanitarian emergencies are vast and complicated, and the strategies employed to mitigate and heal the damage caused by these disturbances must be equal to the task. This course covers diverse topics including the role of NGOs, UN agencies, local governments, peacekeepers and military in humanitarian response; economic impact of humanitarian aid; the evidence base for humanitarian interventions.

PHP 1810. Community-Engaged Research in Public Health.

This course will provide students with the foundational knowledge, perspective, and skills to conduct community-engaged research. While this course will introduce a spectrum of community-engaged research approaches, we will focus primarily on the community-based participatory research (CBPR) approach. We will begin with an introduction to community-engaged research's concepts and principles and a brief history on the theories that shaped CBPR, including how power/privilege influence the way each individual approaches research. We will then move through case studies of CBPR projects and how specific methods can be applied within CBPR. We will end with examples on how CBPR can be used to help shape health policy and advocacy. Students will engage in interactive learning through facilitated discussions, case studies, and reflective activities, will learn real-life applications of CBPR from invited guest speakers and work in groups to complete a community-engaged project.

PHP 1820. Designing Education for Better Prisoner and Community Health.

This course will provide the needed background and context for understanding the multiple issues and challenges facing prisoners and the national justice and health systems that impact their lives. In addition to contextual background, students in this course will attain the knowledge and skills needed to develop a final practical, real world health communication/ intervention project that addresses one or more health literacy challenges facing people who are incarcerated and other low income, medically disenfranchised individuals. Students interested in taking the course must contact the professor directly for an application to obtain an override.

PHP 1821. Incarceration, Disparities, and Health.

This survey course is designed for students who want to interrogate the central role that public health policies and practices play in creating and sustaining the nation's epidemic of incarceration. The course will focus on individuals who have experienced incarceration and the under-resourced, low-income, and medically disenfranchised communities from which these individuals come and to which most will return. Students will learn about the lived experiences of those directly impacted by the criminal legal system through invited speakers who have been incarcerated. Experts who work at the intersection of the criminal legal and health systems will also be invited to the class. Undergraduates who have taken PHP 0310 and PHP 0320 and MPH candidates will have priority for enrollment. Unfilled spaces in the class will be available to undergraduates who have not taken PHP 0310 and PHP 0320.

Fall PHP1821 S01 17690 T 4:00-6:30(07) (B. Brockmann)

PHP 1822. Effective Health Communication With Medically Underserved Populations in an Applied Learning Setting.

This course is designed to provide a foundational understanding of the creation, use, and impact of health communication tools for low-income, medically underserved audiences. The course is group and project-focused. Student project teams will conduct focus groups and key informant interviews with 1) individuals who have been directly impacted by the epidemic of incarceration and 2) experts in the community, to conceptualize, develop, and prototype health communication projects. Projects may address health literacy needs faced by individuals and their communities and/or advocacy needs designed to address systemic or structural health barriers. The course will explore how health communication can be used to effectively address stigma, connect audiences to resources and education, to engage public audiences with emerging concerns, and drive data and advocacy. Learning objectives: - Complete a health communication project or campaign with a small team of other students and

PHP 1854. The Epidemiology and Control of Infectious Diseases.

Course objectives are to introduce students to methods and concepts in the study and control of infectious diseases. By the end of this course, students will have a solid foundation in the distribution, transmission, and pathogenesis of major infectious diseases that affect human populations. We will investigate methods to design and evaluate public health strategies to prevent or eliminate infectious diseases, including: outbreak investigation, disease surveillance, infection control, screening, and vaccination. The course is open to undergraduate students who have completed PHP 0320 or PHP 0850, and to graduate students who have completed or are concurrently enrolled in either PHP 2120 or PHP 2150.

PHP 1855. Infectious Disease Modeling.

This course will introduce infectious disease modeling and its applications. Students will learn to build computational models of infectious disease, fit models to data, leverage models to develop predictions, and target public health interventions. We will explore how models were used during the COVID19 pandemic, and are being used to project the health effects of climate change. We will introduce core mathematical underpinnings including dynamical systems and statistical approaches for model fitting. Students should be familiar with calculus and have prior coding experience in R, Python or Matlab.

Fall	PHP1855	S01	18360	TTh	9:00-10:20(05)	(R. Baker)
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PHP 1880. Meditation, Mindfulness and Health.

This course provides an overview on the relation of meditation and mindfulness (the ability to attend in a nonjudgmental way to one's own physical and mental processes during ordinary, everyday tasks) with various health outcomes and disease risk factors such as depression, anxiety, diet, substance use, and cardiovascular disease. Mechanisms by which mindfulness may influence health will be addressed. The course will assess studies in the field for methodological rigor, and students will be taught strengths and weaknesses of current research. Students will be taught various mindfulness practices including direct experience with mindfulness meditation.

Fall	PHP1880	S01	17559	TTh	2:30-3:50(12)	(E. Loucks)
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PHP 1885. Measuring Mindfulness.

Recently, the cover of Time magazine declared a "mindful revolution" due to its popularity and growing body of research suggesting that mindfulness may help to treat a number of health-related problems from general stress to anxiety to addiction. However, little is known about the underlying mechanisms of how it works. This course will investigate the many ways that mindfulness is measured (e.g. self-report, behavior, EEG, fMRI etc.), and use these as a doorway for our own experiential exploration of what mindfulness is for ourselves.

PHP 1890. The Craving Mind.

We are creatures of habit. Driven by biological processes set up to help us survive, our minds are constantly craving experiences and substances—from smartphones to romance to alcohol—and this craving leads to habit formation. This course will explore the behavioral and mental processes that foster craving and consequent habit formation, the impact these have on individual and societal health, and how we can "hack" our own neurobiological reward circuitry using practices such as mindfulness, to foster greater health and wellbeing. Priority given to Public Health concentrators; all others with instructor permission.

Fall	PHP1890	S01	18126	W	3:00-5:30(10)	(J. Brewer)
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PHP 1895. Mindfulness Epidemiology.

This course focuses on developing skillful application of epidemiologic methods to understand the health effects of mindfulness. Focus will be on study design (clinical trials, observational studies, and systematic reviews/meta-analyses), causal inference, confounding, bias, mediation, effect modifiers, generalizability, and methodological strengths/limitations of the field. Students will create a methodologically rigorous protocol for a mindfulness study.

PHP 1900. Epidemiology of Disorders and Diseases of Childhood and Young Adulthood.

Students will learn about diseases and disorders of childhood and young adulthood, including allergies, autism, eating disorders, obesity, endometriosis, and migraines. Students will learn how these disorders are defined, how many youth are impacted, and the age-appropriate epidemiologic methods to study disorders and diseases during childhood, adolescence, and young adulthood, respectively. For the final project, students will pick a disease or disorder of interest that occurs during childhood, adolescence, or young adulthood, synthesize the results from multiple epidemiological studies, and concisely present this information in both a written report and an oral presentation.

Fall	PHP1900	S01	18603	M	9:00-11:30	(D. Pearlman)
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PHP 1910. Public Health Senior Seminar.

This dynamic course is designed to provide an overarching capstone experience to seniors graduating with a bachelor's degree in Public Health. This class is intended to help students gain in-depth knowledge of public health by utilizing and strengthening both oral and written communication skills. These skills will facilitate communicating with diverse audiences through a variety of media and working in teams. Critical skills such as literature searches, use of bibliographic software, critiquing the literature, working in teams, and writing research papers will be practiced. Current public health topics that are timely will be discussed and public health successes, failures, and areas that need more work and effort will be explored. The course is designed as a seminar emphasizing class discussion, interaction, and debate regarding differing perspectives, as well as in-depth discussion of the assigned readings.

Fall	PHP1910	S01	18130	W	3:00-5:30(10)	(L. Bohlen)
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Fall	PHP1910	S02	18132	W	3:00-5:30(10)	(N. Trivedi)
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PHP 1915. Public Health Honors Senior Seminar.

This dynamic course will provide an overarching public health experience for students in the public health honors track. Students will strengthen oratory, writing, and teamwork skills. The course will add structural support for students beginning their thesis experience. This will include literature review and appraisal, scientific writing, data presentation, and communication of findings to scientific and lay audiences. The instructor is formally trained in Internal Medicine, public health, health policy and clinical epidemiology which will be brought to the classroom. This seminar course will emphasize class discussion, interaction and debate regarding differing perspectives on each topic area, as well as in-depth discussion of the assigned readings.

Fall	PHP1915	S01	18270	W	3:00-5:30(10)	(K. Biello)
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PHP 1920. Social Determinants of Health.

The course provides an overview of social determinants of health. Examples of topics include health effects of educational attainment, social integration, neighborhood socioeconomic characteristics, racial discrimination, gender, income inequality, childhood socioeconomic circumstances, parental neglect, and job strain. Mixed teaching methods are used, including small group discussions, problem-based learning and guest lectures. Open to graduate students and advanced undergraduates.

Fall	PHP1920	S01	17533	M	3:00-5:30(03)	(D. Grigsby)
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PHP 1950. Adolescent and Young Adult Health.

The course will cover the mental and physical health of adolescents and young adults and factors that influence their health, including self-identity, sexual orientation and gender identity, race, weight status, and socio-economic status.

PHP 1964. Cancer Epidemiology and Prevention.

This course is aimed at enhancing the knowledge and skills central to the application of epidemiologic methods to cancer screening, prevention, and control. We will exam cancer incidence and trends in the U.S. and globally, interpret their implication for cancer etiology, and critically analyze current evidence regarding the role of various major risk factors on human cancer risks. The class will focus on the impact of major environmental, occupational, and lifestyle risk factors on cancers of high public health significance.

PHP 1970. Independent Study.

A special project may be arranged in consultation with an individual faculty sponsor. Section numbers vary by instructor. Please check Banner for the correct section number and CRN to use when registering for this course.

PHP 1980. Honors Thesis Preparation.

Two semesters of PHP 1980, Honors Thesis Preparation, will be devoted to the development and implementation of an Honors project, and of the writing of the Honors Thesis for the Public Health Concentration.

PHP 1998. Public Health Nutrition.

Public health nutrition is an interdisciplinary field focused on promoting health and reducing disease risk by improving the nutritional status of populations. The goal of this seminar is to introduce the basic principles of public health nutrition with a focus on the United States. Students will gain an understanding of the science behind government-issued dietary recommendations and learn about methods of dietary assessment, determinants of food intake and nutritional status, and individual-level and environmental-level interventions to improve diet. The course will emphasize the ways in which environmental factors and public policy can influence the nutritional status of diverse population groups. Through discussions and debates, students will explore and critically discuss current public health nutrition controversies, such as taxation of less healthful foods, nutrition restrictions on food stamp purchases, federal agricultural policy, and school food policy among other contested topics.

Fall PHP1998 S01 18547 Th 1:00-3:30 (A. Tovar)

PHP 2015. Foundations of Spatial Analysis in Public Health.

The distribution of power and privilege in society directly shapes where we live and what opportunities we have available to us for achieving optimal health and well-being. Describing how sociopolitical forces shape our neighborhoods and communities can help us understand how and why health and disease vary over space and time. In this course, we will use a combination of didactic lecture sessions and interactive tutorial sessions to develop our knowledge and skills as spatial thinkers and understand how geographic information system applications like ArcGIS can be used to collect, analyze, and visualize spatial data to inform, evaluate, and improve public health programs. In small groups, we will work together to conduct spatial analyses using data from programs delivered by the Rhode Island Department of Health to learn and apply best practices for conducting spatial analyses and communicating their results.

Fall PHP2015 S01 17708 MW 4:00-5:20(03) (W. Goedel)

PHP 2018. Epidemiology of Cardio-Metabolic Health.

This course surveys the entire landscape of the nutritional, biochemical, and genetic aspects of cardiometabolic health addressing issues of obesity, diabetes, metabolic syndrome, and their micro- and macro-vascular complications. Students will learn about both the descriptive and analytical epidemiology of these seemingly distinct but clearly clustered disorders including the so-called metabolic syndrome comprehensively and in-depth. International comparison of prevalent data in different social contexts will also be reviewed, so that strategies for prevention by either changing our cultures or natures can be appreciated and debated with a better understanding of the related issues confronted by public health and medical professionals.

Fall PHP2018 S01 17709 F 9:00-11:30 (S. Liu)

PHP 2019. Measurement Issues in Health Care.

Provides a theoretical and practical basis for measurement in health care. Introduces measurement theory, scale development, and criteria to be considered when choosing measures in clinical practice and research. Practical exercises include questionnaire development and a written research protocol for the development and validation of a new measure. Prerequisites: PHP 2120, 2130.

PHP 2023. Maternal and Child Health in the United States.

This is a graduate level course focused on maternal and child health in the United States.

While some reference will be made to the experience in other countries, the focus of the course will be on the United States. A broad range of health conditions will be covered, with an emphasis on leading causes of mortality and morbidity. In addition, we will examine the range of programs designed to prevent or address important health threats.

Fall PHP2023 S01 18308 Th 4:00-6:30(04) (M. Silverstein)

PHP 2024. Engaged Scholarship in Maternal and Child Health.

This overall goal of this course is to help students develop the knowledge, skills and perspectives necessary to make contributions in the field of maternal and child health, with a particular focus on community-based or community serving interventions, research and evaluation. This includes the short-term goal of helping students prepare for internship, thesis or capstone work and the long-term goal of providing training for students' future career in the field of maternal and child health. In the course students will: *expand their knowledge of current research in maternal and child health and explore the community context of the research.

*develop or refine a skill set that has applications in community-based interventions, research or evaluation.

*complete a community-based or community serving project as part of the Hassenfeld Child Health Innovation Institute 's Community of Learners.

PHP 2030. Clinical Trials Methodology.

We will examine the modern clinical trial as a methodology for evaluating interventions related to treatment, rehabilitation, prevention and diagnosis. Topics include the history and rationale for clinical trials, ethical issues, study design, protocol development, sample size considerations, quality assurance, statistical analysis, systematic reviews and meta-analysis, and reporting of results. Extensively illustrated with examples from various fields of health care research. Recommended prerequisites: introductory epidemiology and statistics. Pre-requisites: (PHP 2120 or PHP 2150) and either PHP 2508, 2510, or 2520. Open to graduate students only.

PHP 2040. Survey Research Methods.

Emphasizes the theory of sampling and survey methods and their application to public health research. Topics include: survey design and planning; principles of sampling and survey terminology; questionnaire construction; protection of human subjects; data collection (including interviewing and data coding procedures); and application, presentation, and evaluation of results. Suggested prerequisites: PHP 2120 or PHP 2140, and PHP 2508 or 2510. Open to graduate students only.

PHP 2060. Qualitative Methods in Health Research.

Introduces qualitative approaches to data collection and analysis in health research. Methods covered include: participant observation, key-informant interviews, focus groups, innovative data collection strategies, and non-obtrusive measures. Students will use applied projects to develop skills in: qualitative data collection and management, interviewing, transcript analysis using computerized software, triangulation between qualitative and quantitative data, and report preparation for qualitative studies. Enrollment limited to 20 graduate students.

Fall PHP2060 S01 18282 F 9:30-12:00(09) (E. Belanger)

PHP 2061. Qualitative Data Analysis in Public Health Research.

This intermediate/advanced graduate seminar focuses on various interdisciplinary approaches to the analysis of textual data, including thematic analysis, grounded theory, phenomenology, and narrative and discourse analysis. Students will explore the philosophical underpinnings of these qualitative data analysis approaches and consider their application in the context of critical theories and methodologies, including intersectionality. Students will also learn practical skills involved in qualitative data analysis, including codebook development, coding, developing themes, categories, and conceptual models, writing memos, and disseminating findings to diverse audiences. The course centers issues of power, ethics, positionality, and reflexivity in the context of qualitative research with minoritized populations and discusses community- and arts-based participatory research approaches. The course also addresses methods for combining qualitative and quantitative research findings in the context of a mixed-methods research approach. Students will have the option to analyze their own or others' qualitative data.

Fall PHP2061 S01 18283 W 1:00-3:30 (K. Andes)

Fall PHP2061 S02 18284 W 1:00-3:30 (M. Agénor)

PHP 2071. Applied Public Health: Systems and Practice.

Applied Public Health is a two-semester sequence of courses designed to give students the skills and experiences they need to master understanding public health and health care systems, policy in public health, leadership, communication, interprofessional practice, and systems thinking. This will be achieved through a combination of lectures, in class exercises, homework assignments, and practical experience in a public health setting. The first course in the sequence (PHP 2071) is taken in the Spring of your first year.

PHP 2072. Applied Public Health: Policy, leadership and communication.

Applied Public Health is a two-semester sequence of courses designed to give students the skills and experiences they need to master understanding public health and health care systems, policy in public health, leadership, communication, interprofessional practice, and systems thinking. This will be achieved through a combination of lectures, in class exercises, homework assignments, and practical experience in a public health setting. The second course (PHP 2072) is taken in the Fall of your second year.

Fall	PHP2072	S01	18278	T	1:00-2:20	'To Be Arranged'
Fall	PHP2072	S02	18279	Th	2:30-3:50	'To Be Arranged'
Fall	PHP2072	S03	18280	W	4:00-5:20	'To Be Arranged'

PHP 2073. Leadership and Communication.

The objective of this two-unit (i.e., 360-hour) course, which students will take online in the summer prior to arriving on campus, is to enable students to become public health leaders who can communicate effectively with a wide variety of audiences. Students will learn leadership principles, such as, how to create a vision, advocate for policies and programs, build coalitions, and use negotiation and mediation strategies. Students will build on their oral and written communication skills, by writing an op-ed delivering a presentation to their peers and interacting with public health leaders and elected officials. Students will also learn from leading experts in the fields of leadership and communication related to public health.

Fall	PHP2073	S01	18018	Arranged		(S. Rivkees)
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PHP 2074. Needs Analysis and Program Planning.

In this 1.5-unit (i.e. 270-hour) service-learning course, students will conduct a needs analysis in an actual clinical health care site, where they will spend a minimum of 80 practicum hours. The practicum portion of the course counts as their Applied Practice Experience (APE). Students will receive information on the APE requirements in the summer before the fall semester. Students will consider levels of intervention including the individual; families or small groups; organizations such as schools, worksites, health care settings; communities; the media; policy and environmental changes. Students will identify personal and environmental factors that affect public health and develop skills in needs assessment, formative research, cultural sensitivity, behavior change theories, intervention mapping, process and impact/outcome evaluation and dissemination. Students will critique intervention studies and gain experience in developing a behavior change intervention.

Fall	PHP2074	S01	18020	Th	2:30-5:00	(M. Harvey)
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PHP 2076. Integrated Learning Experience for Accelerated MPH Program.

The ILE allows students the opportunity to synthesize their public health competencies at the end of the accelerated MPH program. The course will be conducted in a didactic and workshop style format so the attendees will have an experience of how to approach and identify public health topics of interest and how to advance public health messaging, policy, and research. The course will help students become familiar with how to guide and implement findings of clinical medical research to public health policies, conduct research and special attention to ethics of human subjects research and focus on the regulatory procedures for conducting ethical research in clinical settings.

PHP 2080. Public Health Law and Policy.

The global COVID-19 pandemic has brought to the forefront the important role that law – at the federal, state and local levels – plays in public health. Law not only organizes and structures the authority of government actors to intervene to protect the public's health, it also molds the social environment in which people live, shaping access to resources needed to stay healthy. This course will explore the tensions between public health laws and policies and individual rights and freedoms. What authority should the government have to compel individuals, groups and businesses to conform to health and safety standards to promote the common good? What happens when public health intervention infringes on individual rights and liberties? How do laws and policies, and the ways in which those laws and policies are implemented and enforced, affect health equity and justice?

Fall	PHP2080	S01	19073	M	1:00-3:30	(L. Tobin-Tyler)
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PHP 2081. Health Policy and Equity.

The objective of this course is to provide students with a broad overview of the role of policy in population health, relevant equity-focused frameworks, the organization of the US healthcare system, comparative healthcare systems, and the policymaking process. This course will teach and assess students' competency to: Compare the organization, structure and function of health care, public health and regulatory systems across national and international settings Apply ethical principles to public health practice Discuss the means by which structural bias, social inequities and racism undermine health and create challenges to achieving health equity at organizational, community, and societal levels Discuss multiple dimensions of the policy-making process, including the roles of ethics and evidence Evaluate policies for their impact on public health and health equity.

Fall	PHP2081	S01	18550	T	4:00-6:30(07)	(M. Harvey)
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PHP 2090. Research Grant Writing for Public Health.

This course focuses on providing knowledge and experience in creating high quality public health research grant applications. Course objectives include developing significant and innovative scientific hypotheses, learning principles of effective written communication, and developing a research grant application suitable to submit for funding. Designed for Public Health School PhD students, post-doctoral fellows, and Masters students with advanced degrees (e.g. MD, PhD). Prerequisite: PHP 2120 or PHP 2150 or instructor permission.

PHP 2090A. Research Grant Writing for Public Health-Part A.

PHP 2090A is the first in a two-course sequence that enables students to gain hands-on experience in creating high-quality, competitive public health research grant applications. The sequence will focus on writing training- and early-career applications tailored to the National Institutes of Health (e.g., F- and K-series grants). In PHP 2090A, students will draft their specific aims with guidance from their mentor(s), obtain foundational knowledge about the NIH grant submission process, learn about the peer review process, understand the content of NIH grant sections, and develop the foundations of their full grant proposals. They will do this through directed readings, pre-recorded lectures, assignments, instructor-led seminars, and consultation with their primary academic mentors. In PHP 2090B, students will develop a full proposal and receive peer and faculty feedback on it.

Fall	PHP2090A	S01	18330	M	9:00-11:30	(S. Buka)
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PHP 2090B. Research Grant Writing for Public Health-Part B.

PHP 2090B is the second in a two-course sequence that enables students to gain hands-on experience in creating high-quality, competitive public health research grant applications. The sequence will focus on writing training- and early-career applications tailored to the National Institutes of Health. In PHP 2090B, students will develop a full NIH proposal (e.g., F- or K-series or R03/R21), provide feedback to and receive feedback from their peers on proposal documents, and obtain in-depth knowledge of how to design and conduct robust, rigorous, and impactful research studies. They will do this through directed readings, in-person lectures, assignments, and consultation with their primary academic mentors. Topics covered in the course will include basic statistical power calculations, presentation strategies, research misconduct and ethics, picking and managing mentors, and effective budgeting.

PHP 2120. Introduction to Methods in Epidemiologic Research.

Epidemiology quantifies the distribution and determinants of health in populations, with the goal of reducing the burden of negative health outcomes. This intensive introductory course is intended to provide graduate students with a strong foundation in key epidemiological concepts and methods so they can be critical consumers and users of epidemiological research. Students will learn the core principles of study design, calculating measures, and appraising and communicating research through lectures and readings of published epidemiological studies as well as applied practice through exercises and assignments. This is a graduate-level course aimed at Masters' and PhD students. The course is not open to first year students or sophomores but may be available for advanced undergraduates with the instructor's permission.

Fall	PHP2120	S01	18287	TTh	10:30-11:50(13)	(M. Lurie)
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PHP 2130. Human Biology for Public Health.

This course provides basic principles of human biology and its applications to public health. Examples of biology topics include the cardiovascular system, endocrine system, immune system, nervous system, genetics, cancer, cardiovascular disease, HIV/AIDS, and depression. Examples of applied topics include strengths and weaknesses of using biomarkers, accuracy and precision of biological measures, quality assurance and quality control methods for using biomarkers for public health research. Mixed teaching methods are used, including small group discussions, problem-based learning and guest lectures. Prerequisite: PHP 2120 (may be taken concurrently) or instructor permission. Enrollment limited to 20 graduate students.

PHP 2140. Principles of Applied Epidemiology.

Epidemiology quantifies the distribution and determinants of health in populations, with the goal of reducing the burden of negative health outcomes. This intensive introductory course is the first in a methods sequence (followed by PHP 2210 and PHP 2180) and is intended to provide graduate students with a solid foundation in epidemiological concepts in relation to public health. They will use this foundation to build a methodological skill set to enable being critical consumers, users, and producers of research. Students will learn the core principles of research design, bias and confounding, and applied public health and be able to apply their knowledge to critically evaluate and synthesize findings from epidemiological studies and begin producing and communicating their own research products. Collaborative learning is a key component of the course design.

Fall	PHP2140	S01	18546	TTh	2:30-4:00	(S. McBurney)
Fall	PHP2140	C01	18730	Th	4:15-5:15	(S. McBurney)

PHP 2150. Foundations in Modern Epidemiologic Methods.

The overall objective of this course is to provide students with a strong foundation in epidemiologic research methods. This is the first of a three- or four-course sequence in epidemiological methods aimed at students who expect to eventually conduct their own epidemiological research. The course is designed for students enrolled in a PhD program in the School of Public Health, or who are completing the MPH epidemiology concentration. There will be a strong quantitative focus in this course, and the typical student will also have some introductory knowledge of epidemiology. PHP 2507 or 2510 should be taken concurrently. Undergraduate students, fifth year MPH students, or graduate students not in a public health program may request instructor permission (override) through CAB from the instructor.

Fall	PHP2150	S01	17688	TTh	10:30-11:50(13)	(B. Marshall)
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PHP 2160. The Global Burden of Mental Illness: A Public Health Approach.

Provides an introduction to the classification, epidemiology, etiology, treatment and potential prevention of psychiatric disorders from a population perspective. Reviews the magnitude and social burden associated with mental disorders worldwide and opportunities to enhance prevention and treatment.

Covers concepts and methods used to study mental illness at the population level, including definitions of "normality" and "pathology", current classification systems and measurement approaches to assess psychopathology and severity and cross-cultural issues.

Covers the prevalence, risk factors, and etiology of major disorders of children, adolescents and adults, including autism spectrum disorders, attention deficit disorders, mood and anxiety disorders, schizophrenia and substance use disorders.

PHP 2180. Interpretation and Application of Epidemiology.

This course builds upon the foundation of introductory epidemiology and a basic understanding of quantitative and conceptual methods, with a focus on the interpretation of the strength and meaning of epidemiologic findings. The goal is to help students develop critical thinking skills in order to become more sophisticated interpreters of epidemiologic evidence for guiding policy, clinical practice, and individual decisions, combining subject matter knowledge and epidemiologic methods to wisely evaluate the available research findings. We will focus on judging causality and identifying gaps that future research would need to fill to strengthen our understanding. Prerequisite required or permission of instructor.

PHP 2200. Intermediate Methods in Epidemiologic Research.

This second course in epidemiologic methods reinforces the concepts and methods taught in PHP 2150, with in-depth instruction in issues of study design, assessing threats to study validity including confounding and selection bias, and analyzing data with standard regression models. The course emphasizes hands-on learning and includes a combination of didactic lectures, discussions of methodologic papers, and a required laboratory component where students will learn to apply the concepts learned in class to real-world problems. Prerequisites: PHP 2150 and either PHP 2510 or PHP 2507, and PHP 2511 or PHP 2508 (which either can be taken concurrently) or permission of the instructor.

PHP 2210. Surveillance Methods for Applied Epidemiology.

This course will further develop students' skill set by applying methods directly to public health data, building off the epidemiological foundation established in PHP 2140. While focused on applied methods and surveillance practices, epidemiological principles will be emphasized such as assessing systematic and random error in sampling, study design, and data collection. Students will apply these core principles to critically evaluate and synthesize findings from epidemiological studies and begin producing and communicating their own research. Collaborative learning is a key component of the course design. Key course topics include the role of surveillance in public health; the development of case definitions and the collection of data; the assessment of common accuracy limitations in surveillance or secondary data; approaches for cleaning complex data; descriptive statistics generation; sampling and stratification methods; program and policy evaluation; and effective communication in public health practice. If a student has taken only PHP 0850 or an undergraduate biostatistics course, they may be able to take this course with the instructor's permission. The corequisite for this course is an intermediate biostatistics course (PHP 2508, PHP 2511, or equivalent).

PHP 2220B. Nutritional Epidemiology.

This course provides a comprehensive and systematic review of contemporary issues in human nutrition that require the application of epidemiologic principles and quantitative methods. Substantive topics range from the assessment of molecular etiologies for health and disease outcomes to evidence-based development of clinical guidelines and public health policies for foods and dietary supplements. This course is designed for graduate trainees in public health or the division of biology and medicine, visiting fellows, and advanced undergraduates who want to understand or conduct research in human nutrition and dietary assessment related to health and diseases.

PHP 2220E. Topics in Environmental and Occupational Epidemiology.

This course introduces students to the epidemiological study of historical and contemporary environmental/occupational agents, focusing on study design, biases, and methodological tools used to evaluate and extend the evidence linking exposures to human disease. The course will discuss applications, strengths, and limitations of different study designs and their use in studying specific environmental agents. Didactic lectures and student-led discussions will be used to provide students with a basic understanding of and the tools to apply/extend their knowledge of specific environmental agents (endocrine disruptors) and special topics (children's neurodevelopment). Prerequisite: PHP 2120, PHP 2150, or equivalent. Undergrads with PHP 0850 and instructor's permission.

PHP 2220F. Reproductive, Perinatal and Early Childhood Epidemiology.

This course provides an overview of topics related to reproduction, pregnancy, maternal and child outcomes of pregnancy, and long-term consequences related to reproductive health. Methodological issues unique to reproductive and perinatal epidemiology are discussed, as well as general epidemiologic methods as applied to topics in reproductive and perinatal health. Class sessions will include lectures and discussions of published research studies, with active student participation expected. After several introductory lectures, students will select topics and be responsible for organizing a presentation and discussion under the instructor's supervision.

Fall	PHP2220F	S01	18604	T	4:00-6:30(07)	(B. Berger)
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PHP 2220H. The Epidemiology, Treatment and Prevention of HIV.

The purpose of this seminar is to use HIV as an example to introduce students to a variety of methodological issues in the epidemiologic study of infectious diseases. While we will study the treatment and prevention of HIV in detail, emphasizing the current state of knowledge and critiquing the most recent literature, this course aims to use HIV as an example to better understand the variety of methodological issues in global and domestic infectious disease epidemiology today. Enrollment limited to 25 students. Prerequisites: PHP 0850 or PHP 1854 (undergraduates); PHP 2120 or 2150 and PHP 2508 or 2511 (graduate students).

PHP 2232. Contemporary History of Epidemiologic Methods.

In 1987 Sander Greenland published a historical anthology of key papers in epidemiologic methods that were published between 1946 and 1976. In this class, we pick up where Greenland left off, reviewing papers published between 1976 and 2010 that represent some of the major methodological innovations since the publication of his anthology. Our goal is to develop a deeper understanding of the methods by reading the original papers and placing them in the context of what was occurring in the field at the time. Although our focus is on the development of methods in the field of epidemiology, what constitutes an "epidemiologic method" has become less clear as the lines dividing fields have blurred. Thus, several of the papers we will review come from the fields of computer science, econometrics, and biostatistics, among others.

Fall	PHP2232	S01	17773	W	3:00-5:30(10)	(N. Joyce)
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PHP 2235. Pandemics in Global Perspective: From HIV/AIDS to COVID-19.

The objective of this course is to examine key epidemiological methods used for studying and preventing global pandemics. Focusing on two pandemics that played out on different time scales, HIV/AIDS and COVID-19, students will use these two examples of pandemics to better understand the natural history, distribution, pathogenesis, transmission and prevention of infectious diseases globally. We will pay particular attention to issues of disease measurement and the complexities of gathering and interpreting data during an ongoing crisis. We will explore the transmission events that fueled the pandemics under consideration; the social, political and disease dynamics that exacerbated the spread of these infections; efforts to stem their flow, from non-pharmaceutical interventions like social distancing (and the HIV equivalent of limiting the number of sex or needle-sharing partners) to biomedical interventions including therapeutics and vaccines.

PHP 2250. Advanced Quantitative Methods in Epidemiologic Research.

This course provides students with conceptual and quantitative tools based on counterfactual theory and causal diagrams (e.g., DAGs) to make causal inference using data obtained from observational studies. Causal diagrams will be used to provide alternative definitions of, provide clarifications regarding, or inform minimizing common biases. Non-, semi-, and fully parametric methods for minimizing bias will be discussed. These methods include standard regression, instrumental variables, propensity scores, inverse probability weighting, and marginal structural models. Settings when such methods may not be appropriate will be emphasized. Prerequisite: PHP 2200 and 2511; or PHP 2200 and 2508; or instructor permission.

Fall	PHP2250	S01	17710	TTh	1:00-2:20(06)	(C. Howe)
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PHP 2260. Applied Epidemiologic Data Analysis.

This course will lead students through the process of writing a journal-style manuscript based on performing applied epidemiologic data analysis using statistical software (i.e., SAS). This course is best suited for students who already have a research idea in mind and data in hand prior to the start of the course or are able to develop a research question based on de-identified publicly available population-based datasets that will be recommended in the course. Course enrollment is restricted to graduate students.

Fall	PHP2260	S01	17711	W	9:00-11:30	(S. Rosenthal)
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PHP 2300. Research Methods in Behavioral Science.

This course provides a broad overview of the research methods typically used in behavioral and social health sciences research. Students will learn to evaluate qualitative and quantitative public health research critically, to design their own research protocol, and to conduct a systematic review of the literature on a health outcome of their choosing. Prior coursework in research methodology and quantitative methods is recommended but not required. Open to public health graduate students and advanced undergraduates concentrating in public health. Enrollment limited to 15.

Fall	PHP2300	S01	18285	Th	4:00-6:30(04)	(C. Kahler)
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PHP 2310. Physical Activity and Public Health.

This course examines physical activity and health with an emphasis on the development of behavioral interventions to increase physical activity. Students gain knowledge of the impact of physical activity on health outcomes as well as differences in physical activity among subpopulations. They are introduced to behavioral theories, intervention design approaches, measurement issues, and methods that are relevant to physical activity. Through seminar discussions, a group project, and presentations, students engage with the material and gain skills in the development and evaluation of behavioral interventions. Students with an interest in behavioral interventions and physical activity will benefit from taking the course. Recommended prerequisites: PHP 2300 or PHP 2340 or PHP 2355. Enrollment limited to 15. Open to graduate students and seniors concentrating in Public Health.

Fall	PHP2310	S01	18162	T	1:00-3:30	(B. Marcus)
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PHP 2325. Place Matters: Exploring Community-Level Contexts on Health Behaviors, Outcomes and Disparities.

As with many health-related outcomes, the prevalence of ill health is unequally distributed across populations, with certain community features playing significant roles in shaping health. In this course, we will explore the features of place and the associations with health behaviors and health outcomes. The readings for this course are multi-disciplinary in nature and integrate epidemiological, biological, sociological, political and philosophical perspectives. This course is specific to the United States. The course activities will culminate with neighborhood audits, presentations, and policy briefs. Due to the course structure and activities, it is limited to 12 graduate students.

PHP 2330. Behavioral and Social Approaches to HIV Prevention.

This course examines concepts, approaches, and empirical findings from behavioral and social research to prevent HIV transmission. Students will become familiar with behavioral theories, social epidemiological principles, intervention design, and debates within the field of HIV prevention. A particular focus of this course is on the linkages between science and HIV prevention practice/policy. Students will conduct weekly readings, engage actively in seminar discussions, and participate in small-group presentations and research activities. Prior coursework in public health research methodology is recommended. Prerequisites: Graduate student or senior public health concentrator. Enrollment limited to 15 advanced undergraduate, graduate and medical students.

PHP 2340. Behavioral and Social Science Theory for Health Promotion.

This course will help students become familiar with behavioral and social science theories commonly used for planning disease prevention/health promotion interventions. In addition to review of specific theories, topics to be discussed include: how theories are developed and tested; challenges and potential pitfalls in using theory for intervention planning; and creation of causal diagrams based on concepts from theories. Graduate students only. Enrollment limited to 25.

Fall PHP2340 S01 18277 W 9:00-11:30 (D. Williams)

PHP 2345. Affect, Emotion, and Health Behavior.

The purpose of this class is to learn about and discuss theory and research on affective determinants of health-related behaviors across multiple behavioral domains. The common thread through the entire course is that health-related behavior is the dependent variable and affect or emotion is the putative determinant. That is, this is a course about how affect and emotion influences health-related behavior. Although we will, in some instances, discuss the effects of health-related behavior on affect and emotion, emotion and mood are NOT considered to be the outcome of interest.

PHP 2355. Designing and Evaluating Public Health Interventions.

Previously listed as PHP 1740. Examines health behavior decision-making and elements for design of health promotion interventions. Covers theories of health behavior (focusing on primary and secondary prevention), principles of intervention design, and reading of research literature. Emphasizes psychological, social, and proximate environmental influences on individuals' health-related behaviors. Restricted to undergraduates in the AB/MPH program, and graduate students. Prerequisite: PHP 0320 or equivalent. Enrollment limited to 35.

Fall PHP2355 S01 18276 MW 1:00-2:20 (N. Bulled)

PHP 2360. Developing + Testing Theory-Driven, Evidence Based Psychosocial and Behavioral Health Interventions.

This is a graduate-level course designed to provide students with the knowledge and research skills necessary to develop and ultimately test a theory-driven, evidence-based psychosocial or health behavior change intervention. Drawing on research, theory, and practice, students learn how to conduct formative research to inform the content, structure, and format of an intervention, set goals/objectives, develop intervention materials/messages, and evaluate outcomes – all while taking into account factors such as gender, sexuality, race/ethnicity, poverty, culture, social-support/social-capital, etc. Research methods that are relevant for examining efficacy, including study-design, power/sample size calculations, fidelity monitoring, randomization, control conditions, measures selection/assessment, data collection, etc. are covered. Prerequisite: PHP2340 or instructor permission

PHP 2361. Proseminar in Health Behavior Intervention Research.

This course is required for doctoral students in Behavioral and Social Health Sciences. Students will consider advanced topics related to designing, implementing, and evaluating behavioral and social interventions to promote health. The course is designed as a proseminar, emphasizing discussion of primary readings and presentations by experienced intervention researchers.

Fall PHP2361 S01 18364 W 9:00-11:30 (K. Carey)

PHP 2365. Public Health Topics in LGBTQ+ Communities.

This seminar is designed for graduate students interested in health disparities and determinants of health in LGBTQ+ populations (also referred to as sexual and gender minority populations). Students will become familiar with key epidemiological reports, behavioral and social science theories/frameworks, intervention studies, and scientific debates related to the determinants of and disparities affecting the health of LGBT and sexual and gender minority populations. The course will focus primarily on US populations, but will also include global LGBTQ+ and sexual and gender minority populations. Readings and discussion will be considered in light of social, policy, and cultural contexts that frame the lives of LGBTQ+ populations.

PHP 2370. Etiology of Substance Use Disorders.

This course will help students become familiar with behavioral, genetic, neurobiological, and cultural factors related to the onset and course of substance use disorders. In addition to review of specific theories, empirical evidence supporting models will be covered as will the integration of evidence across models. Priority will be given to postdoctoral fellows. BSHS students should take the class for a grade (ABC/NC), special students/postdocs should choose S/NC grade option

PHP 2371. Psychosocial and Pharmacologic Treatment of Substance Use Disorders.

Intended to provide an overview of the history of the treatment of substance use disorders; assessment methods designed to determine progress in substance use treatment; and the current most common types of psychosocial and pharmacologic treatments for substance use. Enrollment limited to 20 graduate and medical students. Instructor permission required. BSHS students should take the class for a grade (ABC/NC), special students/postdocs should choose S/NC grade option.

Fall PHP2371 S01 18775 F 1:00-3:30 (P. Monti)

PHP 2375. Communicating Science to Lay Audiences.

There is a growing need to translate scientific evidence to lay audiences as a way to foster trust in science and facilitate uptake of behavior changes and evidence-based best practices in health policies. However, many researchers do not have the training to disseminate their research to lay audiences. In this course, you will engage in hands-on training to develop lay summaries, animated video scripts, policy briefs, infographics, op-eds and presentations. Each class will be devoted to a few readings and discussion followed by in-class practice of the assigned deliverable. You will focus on one specific article for most activities, lay summary, video script and presentation, and the article related topic area for the policy brief, infographic and op-ed. We will focus on three topic areas - HIV, substance use and obesity. This course is limited to 12 students.

PHP 2380. Health Communication.

This class will explore Health Communication, with a focus on behavioral and social science interventions delivered through health communication programs. The course is structured so that basic building blocks (i.e., definitions of health communication, public health context for health communications interventions, theories of health communication and health behavior change) are presented sequentially early in the semester. Students will synthesize knowledge and demonstrate their understanding of the role of health communication through a final research project. Seniors with concentration in Public Health may enroll with instructor's permission. Enrollment limited to 20 graduate and medical students.

PHP 2400. The U.S. Health Care System: Case Studies in Financing, Delivery, Regulation and Public Health.

Reviews the development of the health care delivery, financing and regulatory control systems in the U.S. and reviews the literature on the relationship between health system structure and the services used and health outcomes that populations experience. A case-study approach is used to understand the inter-relationship between financing, delivery and regulatory components of the health system and their implication for public health by drawing on epidemiological, economic, political and sociological principals. Prerequisites: Graduate standing or PHP 0310 and instructor permission.

PHP 2410B. Interpreting Population Data for Health Services Policy.

Health services research frequently uses existing datasets based upon surveys of, and utilization records collected on, defined populations. Computer technology also makes it possible to link databases. Quality of datasets is crucial for using analyses to make proper recommendations for health policy. Course gives students the opportunity to consider the advantages and disadvantages of using existing health services datasets for investigating health policy issues.

PHP 2410E. Medicare: A Data Based Policy Examination.

This course will explore the role of Medicare as America's health insurer for the elderly and disabled through the use of real Medicare insurance claims data, examining how Medicare policy changes in financing and regulation have affected the delivery and receipt of medical services. At the end of the course students will: 1) know the history of important Medicare policy changes; 2) be able to construct aggregated patient case mix acuity adjusted measures of provider quality using insurance claims data; 3) be able to conduct policy analyses using Medicare claims data that are sensitive to standardized coding schemes. Enrollment limited to 15 graduate students. Prerequisite: PHP 2120, 2508, or 2510. Instructor permission required.

Fall	PHP2410E	S01	18013	Th	1:00-3:30	(V. Mor)
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PHP 2415. Introduction to Evidence-based Medicine.

Unbiased assessments of the scientific literature by means of research synthesis methods are critical for formulating public health policy, counseling patients or prioritizing future research. We focus on the methods and uses of systematic reviews and meta-analyses and their applications in medicine and health policy. After course completion, and with some direction, students will be able to undertake a basic systematic review or meta-analysis. Enrollment limited to 15. Prerequisites: PHP 2120, 2150, or 2460; and PHP 2507/08 or 2510/11 (2508 and 2511 may be taken concurrently); and clinical background or training in basic concepts in medicine (must discuss with instructor).

PHP 2428. Health Justice.

Health justice conceptualizes the ways in which health inequities are rooted in laws, policies, and practices that structure the opportunity to be healthy. This course will explore the deeply embedded, historical and legal underpinnings of racial, ethnic, gender-based and ableist health inequities in the U.S. We will consider how specific laws and policies—as written, implemented, and enforced—drive persistent health inequities. Further, we will analyze law and policy reforms focused on remedying health inequities. Topics will include: the role of civil rights, human rights, and reproductive rights in health justice; policy-driven structural inequities—such as, economic inequality, place-based disparities, and mass incarceration; how past and current discrimination and stigma influence the health of marginalized groups; and intersectoral frameworks for public health, medicine, and law to promote health justice.

PHP 2440. Introduction to Pharmacoepidemiology.

The course will focus on substantive topics in pharmacoepidemiology, including relevant principles of pharmacology, inference from spontaneous case reports, study design considerations, premarketing pharmacoepidemiology, common data sources for pharmacoepidemiologic studies, drug utilization review, adherence, and the development, implementation, and assessment of therapeutic risk management policies. The course will also focus on issues in pharmacovigilance, including the legal and historical basis of pharmacovigilance, evaluation of individual adverse drug events, signal detection, active safety surveillance, and medication errors. A clinical background is not required. Prerequisites are PHP 2507, PHP 2508, PHP 2510, or PHP 2511, AND PHP 2120 or PHP 2150, or permission.

PHP 2445. Minding the Gap: The U.S. Healthcare Safety Net.

The right to access affordable, quality health care in the US is not guaranteed. During our nation's history, a patchwork quilt of programs, referred to collectively as the safety net, has been crafted to address health care needs for a wide range of people who fall through the cracks. This course examines its structure, function, and effects. We introduce key features of the safety net: access, cost, quality, and outcomes. We pay particular attention to the nation's largest program, Medicaid. We highlight the unique challenges facing vulnerable groups: legal and illegal immigrants, homeless populations, veterans, and people with disabilities.

Fall	PHP2445	S01	18040	F	9:20-11:50	(T. Shireman)
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PHP 2446. Health Care Financing and Delivery.

The purpose of the course is to foster your development into a health services and policy researcher. To accomplish this, the course involves a general survey of substantive issues in payment and financing in healthcare. By the end of the course you should have knowledge of the main institutions, policy issues, and research areas and questions related to payment and financing in US healthcare. You should also have an initial understanding of where the most promising and pressing areas of research lie within this field. Thus, this course is about the past, present, and future of the field.

Fall	PHP2446	S01	18579	F	1:00-3:30	(A. Ryan)
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PHP 2450. Measuring and Improving the Quality of Health Care.

The quality of health care in the United States is in urgent need of improvement. This course will focus on the science of measuring and improving the quality of health care. Topics will include quality assessment, patient safety, medical errors, public reporting, financial incentives, organizational change, and health care disparities. Students will engage in a team-based quality improvement project. Open to graduate and medical students only.

PHP 2451. Exchange Scholar Program.

Fall	PHP2451	S01	16611	Arranged		'To Be Arranged'
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PHP 2455A. Health Services Research Methods I.

Health services researchers use theories, models, and data to understand the health care system, assess the effectiveness of interventions (at multiple levels of the healthcare system), and inform health policy decisions. This course reviews the application of statistical and epidemiological principles to the design and analysis of health services research studies. The goal is to familiarize students with common study designs and methods in health services research, so that they can critically review the published literature and use these approaches in their own research.

Fall	PHP2455A	S01	18407	M	1:00-3:30	'To Be Arranged'
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Fall	PHP2455A	C01	18408	M	4:30-5:30	'To Be Arranged'
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PHP 2455B. Health Services Research Methods II.

Health services researchers use theories, models, and data to understand the health care system, assess the effectiveness of interventions (at multiple levels of the healthcare system), and inform health policy decisions. This course reviews the application of statistical and epidemiological principles to the design and analysis of health services research studies with a focus on causal inference methods. Methods and topics we will cover include panel data designs, difference-in-difference, synthetic controls, GEE, random and fixed effects, survival analysis, missing data, IV, propensity scores, research ethics, and statistical methods to study equity. This doctoral level course is the continuation of PHP2455A, and students are recommended to take both in sequence, however students with sufficient epidemiologic or econometric training may enroll with instructor permission.

PHP 2465A. Introduction to Health Decision Analysis.

Many decisions in health are value-laden, involve competing objectives, or must be made under uncertainty. Health decision analysis is a structured approach to thinking through such decisional problems. This course introduces decision analysis and cost-effectiveness analysis for public health and clinical problems. It covers basic theory for decisionmaking; principles and techniques for mathematical modeling; and implementation, by analyzing archetypical decisional problems in health. Pre Requisites: Some facility with mathematical notation and basic concepts in probability (advanced undergraduate students can enroll after instructor approval). Recommended course: DATA 1010, MATH 1610, or APMA 1690.

Fall	PHP2465A	S01	18039	W	1:00-3:30	(T. Trikalinos)
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PHP 2470. Topics in Clinical, Translational and Health Services Research.

Through a combination of mini-courses and seminars, students will explore concepts, gain knowledge and develop skills in a variety of public health areas. To receive a half credit for this course, students will be required to successfully complete 70 units. Units must be pre-determined by the course instructor and the unit instructor. Units are generally based on the number of in-person contact hours and the number of outside of class/homework hours required for a mini-course or seminar. Students must receive special permission from the instructor or be accepted to the Clinical and Translational Research Summer Institute to enroll.

PHP 2480. Selected Topics in Health Economics.

The course surveys health econometrics methods as applied to selected topics in public health. It focuses on advanced econometrics methods including randomized experiments, discrete choice experiments, differences-in-differences, instrumental variables, regression discontinuity, and synthetic controls. The course covers applied topics related to economic incentives, health insurance, and econometric evaluation of interventions and policies on health outcomes. The course assumes exposure to basic regression analysis methods. Prerequisites: ECON 1630, or equivalent. Enrollment limited to 8 graduate students. Instructor permission required.

PHP 2490. Methods in Pharmacoepidemiology.

This course will cover applications of epidemiological, biostatistical, and other methods to the study of outcomes of medical interventions (drugs, vaccines, biologics, devices, and procedures) in large numbers of people. The course will focus on more advanced study designs (e.g., sequential target trial emulation) and analytic methods (e.g., high-dimensional propensity score estimation). Methods for evaluating the robustness of study results (i.e., sensitivity and stability analyses) will also be discussed. Formal frameworks of causal inference will be used throughout the course and will be applied to substantive topics in pharmacoepidemiology, vaccine epidemiology, and medical device epidemiology. Prerequisites: PHP 2120, PHP 2140, or PHP 2150; and PHP 2507 or 2510; and PHP 2200; and PHP 2508 or PHP 2511; or instructor permission.

Fall	PHP2490	S01	17712	Th	3:00-5:30	(A. Zullo)
Fall	PHP2490	L01	17713	W	3:00-4:00	(A. Zullo)

PHP 2506. Biostatistics for Public Health Research.

This course will provide a foundation in statistical thinking for public health research. It is primarily intended for MPH students on the qualitative research track and MPH students in the accelerated program for clinicians. Others can register with instructor's permission. Students will learn the use and evaluate the appropriateness of statistical methods for analyzing medical and public health data, and learn how to interpret and present statistical findings. They will also gain hands-on experience using statistical software for data analysis.

Fall	PHP2506	S01	18351	TTh	9:00-10:20(05)	(S. Chrysanthopoulou)
Fall	PHP2506	L01	18352	M	9:00-10:00	(S. Chrysanthopoulou)
Fall	PHP2506	L02	18353	W	9:00-10:00	(S. Chrysanthopoulou)

PHP 2507. Biostatistics and Applied Data Analysis I.

The objective of the year-long, two-course sequence is for students to develop knowledge, skills and perspectives necessary to analyze data to answer public health questions. The year-long sequence focuses on statistical principles as well as the applied skills necessary to answer public health questions using data, including: data acquisition, data analysis, data interpretation and the presentation of results. Using lectures, labs and small group discussions, we focus on evaluating data sources, refining research questions, univariate and bivariate analyses, and presentation of initial results. Prerequisite: understanding of basic math concepts and terms. Enrollment limited to 50 students. Instructor permission required.

Fall	PHP2507	S01	17714	W	6:30-8:00PM(06)	(A. Gjelsvik)
Fall	PHP2507	S01	17714	Th	1:00-2:20(06)	(A. Gjelsvik)
Fall	PHP2507	L01	17715	W	3:00-4:20	(A. Gjelsvik)
Fall	PHP2507	L02	17716	W	5:00-6:20	(A. Gjelsvik)
Fall	PHP2507	L03	17717	Th	5:00-6:20	(A. Gjelsvik)

PHP 2508. BioStatistics and Data Analysis II.

Biostatistics and Applied Data Analysis II is the second course in a year-long, two-course sequence designed to develop the skills and knowledge to use data to address public health questions. The sequence is completed in one academic year, not split across two years. The courses focus on statistical principles as well as the applied skills necessary to answer public health questions using data, including: acquisition, analysis, interpretation and presentation of results. This spring semester course focuses on regression, interpretation of results, and communication of results. Prerequisite: PHP 2507. Enrollment limited to 50. Instructor permission required.

PHP 2510. Principles of Biostatistics and Data Analysis.

Intensive first course in biostatistical methodology, focusing on problems arising in public health, life sciences, and biomedical disciplines. Summarizing and representing data; basic probability; fundamentals of inference; hypothesis testing; likelihood methods. Inference for means and proportions; linear regression and analysis of variance; basics of experimental design; nonparametrics; logistic regression. Priority given to students in School of Public Health graduate programs. All others with instructor permission. Limited to PhD students and MPH Epidemiology Concentrators MPH students not in the Epi concentration should take 2506 or 2507

Fall	PHP2510	S01	18290	TTh	9:00-10:20(05)	(S. Dunsiger)
Fall	PHP2510	L01	18291	F	9:00-9:50	'To Be Arranged'
Fall	PHP2510	L02	18292	F	10:00-10:50	'To Be Arranged'
Fall	PHP2510	L03	18293	T	4:00-4:50	'To Be Arranged'
Fall	PHP2510	L04	18294	Th	4:00-4:50	'To Be Arranged'

PHP 2511. Applied Regression Analysis.

Applied multivariate statistics, presenting a unified treatment of modern regression models for discrete and continuous data. Topics include multiple linear and nonlinear regression for continuous response data, analysis of variance and covariance, logistic regression, Poisson regression, and Cox regression. Prerequisite: APMA 1650 or PHP 2510. Open to advanced undergraduates with permission from the instructor.

PHP 2514. Applied Generalized Linear Models.

This course provides a survey of generalized linear models (GLMs) for outcomes including continuous, binary, count, survival and correlated data. This course will work through the basic theories of GLMs. Emphasis will be on understanding the implications of this theory and the applications to solving real data problems. Extensive use of computer programming will be required to analyze the data in this class. This course is designed for graduate and advanced undergraduate students who will be analyzing data and want to develop a practical hands on toolkit as well as understanding of the theoretical underpinnings of regression. Non-Biostatistics graduate students who have taken APMA1650, PHP2515, or PHP2520 (or an equivalent course) can request instructor permission to enroll.

Fall	PHP2514	S01	18397	TTh	1:00-2:20(06)	(S. Chrysanthopoulou)
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PHP 2515. Fundamentals of Probability and Statistical Inference.

This course will provide an introduction to probability theory, mathematical statistics and their application to biostatistics. The emphasis of the course will be on basic mathematical and probabilistic concepts that form the basis for statistical inference. The course will cover fundamental ideas of probability, some simple statistical models (normal, binomial, exponential and Poisson), sample and population moments, nite and approximate sampling distributions, point and interval estimation, and hypothesis testing. Examples of their use in modeling will also be discussed.

Fall PHP2515 S01 18374 MW 9:00-10:20 (A. Oganisian)

PHP 2516. Applied Longitudinal Data Analysis.

This course provides a survey of longitudinal data analysis. Topics will range from exploratory analysis, study design considerations, GLM for longitudinal data, covariance structures, generalized linear models for longitudinal data, marginal models and mixed effects. Data and examples will come from medical/pharmaceutical applications, public health and social sciences.

This course is designed for graduate and advanced undergraduate students who will be analyzing data and want to develop a practical hands on toolkit as well as understanding of the theoretical underpinnings of regression. Students in this class will need an understanding of how to work with Stata. Prereq is: PHP 2511 or PHP 2514; PHP 2508 with Permission from Instructor.

PHP 2517. Applied Multilevel Data Analysis.

This course provides a survey of multilevel data analysis. Topics will range from structure of multilevel data, basic multilevel linear models, multilevel GLM, Model testing and evaluation and missing data imputation. Data and examples will be drawn from medical, public health and social sciences. Students will be using real data throughout this course.

This course is designed for graduate and advanced undergraduate students who will be analyzing data and want to develop a practical hands on toolkit for multilevel analysis. Students in this class will need an understanding of how to work with R. Prereq is: PHP 2511 OR PHP 2514; PHP 2508 with Permission from Instructor.

PHP 2520. Statistical Inference I.

First of two courses that provide a comprehensive introduction to the theory of modern statistical inference. PHP 2520 presents a survey of fundamental ideas and methods, including sufficiency, likelihood based inference, hypothesis testing, asymptotic theory, and Bayesian inference. Measure theory not required. Open to advanced undergraduates with permission from the instructor.

Fall PHP2520 S01 18398 TTh 9:00-10:20(05) 'To Be Arranged'

PHP 2530. Bayesian Statistical Methods.

Surveys the state of the art in Bayesian methods and their applications. Discussion of the fundamentals followed by more advanced topics including hierarchical models, Markov Chain Monte Carlo, and other methods for sampling from the posterior distribution, robustness, and sensitivity analysis, and approaches to model selection and diagnostics. Features nontrivial applications of Bayesian methods from diverse scientific fields, with emphasis on biomedical research. Prerequisites: APMA 1650, PHP 2510, PHP 2511, or equivalent. Open to advanced undergraduates with permission from the instructor.

PHP 2550. Practical Data Analysis.

Covers practical skills required for successful analysis of scientific data including statistical programming, data management, exploratory data analysis, simulation and model building and checking. Tools will be developed through a series of case studies based on different types of data requiring a variety of statistical methods. Modern regression techniques such as cross-validation, bootstrapping, splines and bias-variance tradeoff will be emphasized. Students should be familiar with statistical inference as well as regression analysis. The course will use the R programming language.

Fall PHP2550 S01 18399 TTh 10:30-11:50(13) (A. Paul)

PHP 2560. Statistical Programming with R.

Statistical computing is an essential part of analysis. Statisticians need not only be able to run existing computer software but understand how that software functions. Students will learn fundamental concepts – Data Management, Data types, Data cleaning and manipulation, databases, graphics, functions, loops, simulation and Markov Chain Monte Carlo through working with various statistical analysis. Students will learn to write code in an organized fashion with comments. This course will be taught using both R and Julia languages in a flipped format.

Non-Biostatistics graduate students who have taken PHP 2510 (or an equivalent course) can request instructor permission to enroll.

Fall PHP2560 S01 18380 TTh 2:30-3:50(12) (A. Paul)

PHP 2561. Methods in Informatics and Data Science for Health.

The goal of this course is for students to develop a solution that uses data science and informatics approaches to address a biomedical or health challenge. This course will teach informatics and data science skills needed for public health and biomedicine research. Emphasis will be given to algorithms used within the context of biomedical research and health care, including those used in biomolecular sequence analysis, electronic health records, clinical decision support, and public health surveillance. This course has been developed as a Course-based Undergraduate Research Experience (CURE), where students will gain experience with the scientific method, its application, and presentation.

PHP 2580. Statistical Inference II.

This sequence of two courses provides a comprehensive introduction to the theory of modern inference. PHP 2580 covers such topics as non-parametric statistics, quasi-likelihood, resampling techniques, statistical learning, and methods for high-dimensional Bioinformatics data. Prerequisite: PHP 2520. Open to advanced undergraduates with permission from the instructor.

PHP 2590. Design of Experiments.

Introduces the basic concepts and types of experimental designs with a focus on their statistical properties. Concepts covered include randomization, replication, blocking, matching, nesting, control of variation, interaction, random and fixed factors, choice of controls, estimation of precision, and sample sizes. Types of designs to be covered include classical designs such factorial, fractional factorial, split plot, randomized blocks, incomplete blocks, crossover, repeated measures, Latin squares, and central composite as well as more recent designs such as platform, adaptive, N-of-1, stepped wedge and dose finding.

PHP 2601. Linear Models.

This course will focus on the theory and applications of linear models for continuous responses. Linear models deal with continuously distributed outcomes and assume that the outcomes are linear combinations of observed predictor variables and unknown parameters, to which independently distributed errors are added. Topics include matrix algebra, multivariate normal theory, estimation and inference for linear models, and model diagnostics. Prerequisites: APMA 1650 or 1660, or taking PHP 2520 concurrently.

Note: The course will cover fundamental and advanced topics in linear models, and concepts related to the generalized linear models will not be covered during the course.

Fall PHP2601 S01 18385 TTh 1:00-2:20(06) 'To Be Arranged'

PHP 2602. Analysis of Lifetime Data.

Comprehensive overview of methods for inference from censored event time data, with emphasis on nonparametric and semiparametric approaches. Topics include nonparametric hazard estimation, semiparametric proportional hazards models, frailty models, multiple event processes, with application to biomedical and public health data. Computational approaches using statistical software are emphasized. Prerequisites: PHP 2510 and 2511, or equivalent. Open to advanced undergraduates with permission from the instructor.

PHP 2605. Generalized Linear Models.

This course will focus on the theory and application of generalized linear models (GLM), a unified statistical framework for regression analyses. Specifically, we will focus on using GLMs to model the categorical outcomes. The GLM for categorical outcomes include logistic regression, proportional odds model, and Poisson regression. Maximum likelihood estimation and inference will be introduced in the GLM context. The students are expected to have knowledge of probability and inference (at the level of APMA1650, APMA1660, or PHP2520), knowledge of matrix algebra (at the level of MATH0520), knowledge of regression analysis (at the level of PHP2511) and knowledge of R.

PHP 2610. Causal Inference and Missing Data.

Systematic overview of modern statistical methods for handling incomplete data and for drawing causal inferences from "broken experiments" and observational studies. Topics include modeling approaches, propensity score adjustment, instrumental variables, inverse weighting methods and sensitivity analysis. Case studies used throughout to illustrate ideas and concepts. Prerequisite: MATH 1610 or PHP 2511 or PHP 2580.

Fall PHP2610 S01 18343 TTh 9:00-10:20(05) (Y. Lee)

PHP 2620. Statistical Methods in Bioinformatics, I.

Introduction to statistical concepts and methods used in selected areas of bioinformatics. Organized in three modules, covering statistical methodology for: (a) analysis of microarray data, with emphasis on application in gene expression experiments, (b) proteomics studies, (c) analysis of biological sequences. Brief review and succinct discussion of biological subject matter will be provided for each area. Available software will be introduced. Intro level statistics (PHP 2507/2508 or PHP 2510/2511) recommended. Other students should contact instructor. Intro to software R and Bioconductor tools provided in lab. Open to advanced undergraduates with permission from the instructor.

PHP 2650. Statistical Learning and Big Data.

This course will introduce modern statistical learning tools with a focus on tools developed for big data. It covers three interconnected components: statistical machine learning methods, the underlying algorithms, and computational tools. This course will focus on the principal techniques to analyze data from start to finish: managing large data, exploring patterns, framing statistical problems, building efficient computational algorithms, and writing reports. Topics will include data management, feature engineering, clustering, convex optimization algorithms, tree/ensemble methods, and predictive modeling. Non-biostatistics students who have taken 2510 and 2511 may request permission to enroll.

PHP 2670. Simulation Models for Public Health Decision Making.

The primary objective of this course is to provide a survey of commonly used simulation models in Public Health Research including cohort-/population-based, microsimulation, agent-based, and compartmental models. Emphasis will be on the applications of these models to inform decision making, such as in cost-effectiveness analysis (CEA) and comparative effectiveness research (CER). Basic concepts of the design and analysis of simulation studies will be covered. The course will also provide an overview of statistical methods for developing these models, including parameter calibration, validation, predictive accuracy, uncertainty propagation, and reporting practices. Students will have the opportunity to learn more about the development and application of simulation models in Public Health by attending presentations from accomplished scientists in the area, who will give guest-lectures during the semester. Prerequisites: The course is primarily intended for Graduate Students conducting research or interested in a relevant research area. Students should have prior knowledge of probability and statistical inference (e.g., PHP2510, PHP2515) and regression analysis (e.g., PHP 2511, PHP2514). Familiarity with R, Python, or other similar programming languages is also advisable. Students who wish to take the course may also contact the instructor to determine whether they have the required knowledge and ask for an override code.

PHP 2690A. Advanced Topics in Biostatistics.

Introduction to applications of statistics and the way statisticians collaborate in interdisciplinary research. Guest lecturers from industry, government and academia will describe how statisticians fit into their environment. Techniques for effective collaboration and oral and written presentation of work including interviewing, writing proposals, giving talks, working with a team and consulting as an individual will be taught. Designed for graduate students (Masters or PhD) who would like to learn how to collaborate on projects with non-statisticians. Permission of the instructor is required to enroll for the course.

Fall PHP2690A S01 18354 F 9:00-11:30 'To Be Arranged'

PHP 2700. Lessons (Un)Learned in Public Health and Humanitarian Response: A Historical Perspective.

Public health challenges complicate the response to humanitarian crises around the world, including disease outbreaks, war, and forcible displacement. Although the common narrative in our field is that the complex social, political and ideological challenges we're facing is unprecedented, an examination of the history of public health in acute crises reveals that many struggles confronting us today are neither entirely novel nor unique. This course posits that public health experts rarely understand the full nature of previous crises, and argues that a better understanding of historical events will improve our response to future crises. Through thoughtful reflection and interactive discussion, we will explore the oft-repeated themes that continue to challenge public health and humanitarian response to this day, and examine the progress we've made as a field. Most importantly, we will question why lessons identified so often fail to become lessons learned.

Fall PHP2700 S01 18406 W 9:00-11:30 (C. Spencer)

PHP 2710. Interdisciplinary Perspectives on Disability and Death in the Global South.

The course fosters interdisciplinary critical and integrative thinking and writing about the leading causes of disease, disability and death in low and middle income countries, and potential solutions to prevent and ameliorate these burdens of disease. The first part focuses on measures of population health, health disparities, multi-causal and multi-level thinking, social epidemiology, community interventions and implementation research. These topics provide the fundamental intellectual frameworks for global public health. The second part presents scholars from key disciplinary areas contributing to global health research and practice from many academic units at Brown University. To conclude students present their potential research ideas.

Fall PHP2710 S01 18160 M 1:00-3:30 (M. Sarker)

PHP 2720. Implementing Public Health Programs and Interventions in the Global South.

This course will focus on theory and methods related to the development, adaptation, implementation, and evaluation of public health interventions in the Global South. This course will focus on the influence of social, structural, political, and organizational processes on all aspects of development and evaluation of public health interventions in the Global South. We will cover the field of implementation science and critically analyze approaches for the evaluation of ongoing global public health programs. We will focus on the issue of how evidence-based interventions translate to practice and policy and the evaluation of the implementation of interventions in the "real-world."

Fall PHP2720 S01 18286 F 9:00-11:30 (J. Pellowski)

PHP 2730. Including the Excluded: Global Health Ethics.

This course explores the ethics of global public health engagement. Global health implementation is fraught with ethical conundrums. These ethical conundrums include the process of generating rigorous evidence, championing health as a human right, engaging global partners in meaningful collaborations, and implementing complex programs in low-resource settings. These ethical challenges are driven by North-South inequities and by differences in socioeconomic backgrounds, culture, language, and other intersectional identities. This course introduces scholars to global health ethics as a framework for tackling health disparities, grappling in a scholarly and practical way with the complex fabric of global health research, policy, and practice.

PHP 2740. Learning Global Health by Doing Global Health: Global Health Thesis Seminar.

This course prepares students for constructive engagement in cross-cultural research. The course aims to familiarize students with global funding priorities and research approaches, and to ask questions about meaningful cross-cultural engagement. Part I (Weeks 1-5) covers global health research priorities and writing a small grant proposal. Part II (Weeks 6-12) focuses on acquiring skills and knowledge to plan and implement a global health project, including strategies for community and stakeholder engagement, the challenges and opportunities of cross-cultural research, and tools for project implementation. This course is a research fieldwork preparation seminar intended to prepare students for global field-based research.

PHP 2760. Critical Perspectives in Global Health.

An overview of social theory and analytical approaches relevant to the study of global health topics and their social context. Students learn writing skills and analytical tools and methods for in-depth analyses of global health topics, including social science critiques of global health policy and practice. The goal is for students to learn the skills to conduct critical social analysis of global health issues using qualitative or quantitative data, or mixed methods approaches, on topics ranging from patterns of disease prevalence, to health systems functioning, to community-level project implementation and evaluation. Suitable for students writing theses or papers for publication.

PHP 2950. Doctoral Seminar in Public Health.

The purpose of this seminar is to facilitate discussions of current scientific literature in epidemiology, biostatistics, health services, behavioral and health sciences, and public health in general. The main goal is to expose students to current methodological issues and controversies, in an effort to integrate knowledge across disciplines. This seminar is only open to doctoral students in Epidemiology, Behavioral and Social Health Sciences, Biostatistics and Health Services Research.

Fall	PHP2950	S01	18333	M	12:00-12:50	(C. Spencer)
Fall	PHP2950	S02	18340	T	12:00-12:50	(Y. Lee)
Fall	PHP2950	S03	18341	W	12:00-12:50	(H. Ziobrowski)
Fall	PHP2950	S04	18342	F	1:00-1:50(08)	(K. Carey)

PHP 2980. Graduate Independent Study and Thesis Research.

Section numbers vary by instructor. Please check Banner for the correct section number and CRN to use when registering for this course.

PHP 2981. Graduate Independent Study and Thesis Research (half-credit).

Half-credit independent study research course consisting of 90 credit hours of supervised independent work. Intended for master's students. Section numbers vary by instructor. Please check Banner for the correct section number and CRN to use when registering for this course.

PHP 2985. MPH Independent Study for Thesis Preparation and Research.

This optional half credit course may be taken up to two times during preparation for the MPH degree. It provides MPH students with self-directed thesis research and preparation time under the guidance of a thesis advisor. Prior to taking this course the student and advisor must reach agreement as to what constitutes satisfactory completion of the course (e.g., completion of a satisfactory literature review, attainment of specific thesis benchmarks, or completion of the thesis). Please check Banner for the correct section number and CRN to use when registering for this course.

PHP 2988. SPH Doctoral Teaching Experience (TE).

The Teaching Experience (TE) independent study is designed to enable graduate students to expand practical teaching skills as course coordinators/instructors under the mentorship of an experienced instructor. While the TE is primarily a learning opportunity for doctoral students, secondarily, the activities associated with the TE should add value to the class by enhancing the experience of students enrolled in the course and assisting the faculty instructor with administration and delivery of the course. TEs are generally arranged according to student interests and goals and then approved by the student's Graduate Program Director. Once approved, a student will register for the independent study section with the instructor teaching the TE-associated course. Students should consult their Graduate Program Handbook for more information.

PHP 2990. Thesis Preparation.

For graduate students who have met the residency requirement and are continuing research on a full time basis.

Fall	PHP2990	S01	16612	Arranged	'To Be Arranged'
Spr	PHP2990	S01	25266	Arranged	'To Be Arranged'

PHP XLIST. Courses of Interest to Concentrators in Community Health.