The School of Public Health

Dean
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Ira B. Wilson

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 Class of 2023 and Beyond

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

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Required for All Seniors</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHP 0310</td>
<td>Health Care in the United States</td>
<td>1</td>
</tr>
<tr>
<td>PHP 0320</td>
<td>Introduction to Public Health</td>
<td>1</td>
</tr>
<tr>
<td>PHP 0850</td>
<td>Fundamentals of Epidemiology</td>
<td>1</td>
</tr>
<tr>
<td>PHP 1501</td>
<td>Essentials of Data Analysis</td>
<td>1</td>
</tr>
<tr>
<td>PHP 1910</td>
<td>Public Health Senior Seminar (required of all non-honors seniors; FALL)</td>
<td>1</td>
</tr>
</tbody>
</table>

Or

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Required for All Seniors</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHP 1915</td>
<td>Public Health Honors Senior Seminar (required of all honors seniors; FALL)</td>
<td>1</td>
</tr>
</tbody>
</table>

2. Environmental Health and Policy (select one of the following):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHP 0720</td>
<td>Public Health and the Environment</td>
</tr>
<tr>
<td>PHP 1101</td>
<td>World of Food: Personal to Global Perspectives on Nutrition, Agriculture and Policy</td>
</tr>
<tr>
<td>PHP 1700</td>
<td>Current Topics in Environmental Health</td>
</tr>
<tr>
<td>PHP 1720</td>
<td>Environmental Exposure Assessments in Practice</td>
</tr>
<tr>
<td>PHP 1730</td>
<td>Climate Risks and Health Solutions</td>
</tr>
</tbody>
</table>

3. Health, Health Care Systems, and Policy (select one of the following):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHP 0330</td>
<td>Public Health Policy</td>
</tr>
<tr>
<td>PHP 0650</td>
<td>From Manufacturer to Patient: Why is the Cost of Prescription Drugs So Damn High?</td>
</tr>
<tr>
<td>PHP 1100</td>
<td>Comparative Health Care Systems</td>
</tr>
<tr>
<td>PHP 1450</td>
<td>COVID-19, Public Health, and Health Policy</td>
</tr>
<tr>
<td>PHP 1460</td>
<td>Public Health in a Changing World: Law, Policy &amp; Justice</td>
</tr>
</tbody>
</table>

4. Social and Behavioral Science for Prevention (select one of the following):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHP 0400</td>
<td>Intro. to Health Disparities &amp; Making Connection btw Structure, Social Determinants &amp; Health Equity</td>
</tr>
<tr>
<td>PHP 0700</td>
<td>Global Public Health Interventions</td>
</tr>
<tr>
<td>PHP 1101</td>
<td>World of Food: Personal to Global Perspectives on Nutrition, Agriculture and Policy</td>
</tr>
<tr>
<td>PHP 1300</td>
<td>Parenting Behaviors and Child Health</td>
</tr>
<tr>
<td>PHP 1540</td>
<td>Alcohol Use and Misuse</td>
</tr>
<tr>
<td>PHP 1600</td>
<td>Obesity in the 21st Century: Causes, Consequences and Countermeasures</td>
</tr>
<tr>
<td>PHP 1610</td>
<td>Tobacco, Disease and the Industry: cigs, e-cigs and more</td>
</tr>
<tr>
<td>PHP 1650</td>
<td>Race, Racism and Health</td>
</tr>
<tr>
<td>PHP 1680U</td>
<td>Intersectionality and Health Inequities</td>
</tr>
<tr>
<td>PHP 1690U</td>
<td>Technology and Health Behavior Change</td>
</tr>
</tbody>
</table>
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**
- MATH 0100 Single Variable Calculus, Part II
- MATH 0180 Multivariable Calculus

**LEVEL I - Foundations in Mathematics - Linear Algebra**
- MATH 0520 Linear Algebra

**Computing**
- APMA 0160 Introduction to Scientific Computing or CSCI 0040 Introduction to Scientific Computing and Problem Solving

**Introduction to Statistical Thinking and Practice**
- PHP 1501 Essentials of Data Analysis

**LEVEL II - Core Courses in Theory and Data Analysis**
- APMA 1650 Statistical Inference I or APMA 1655 Honors Statistical Inference I
- APMA 1660 Statistical Inference II
- MATH 1610 Probability
- MATH 1620 Mathematical Statistics

**Introduction to Biostatistics**
- PHP 1510 Principles of Biostatistics and Data Analysis

**LEVEL III: Advanced Courses in Statistical Methods**
- PHP 1560 Statistical Programming in R

**Capstone Project**
- PHP 1970 Independent Study

**Electives in Social Science and Biostatistics (Students must choose 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 Neurosciences
- ECON 1360 Health Economics
- ECON 1630 Mathematical Econometrics I
- ECON 1640 Mathematical Econometrics II
- ECON 1660 Big Data
- MATH 1810A Applied Algebraic Topology

**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 honors 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: Roee Gutman, Box G-S-121-7; Telephone: 401-863-2682; Fax: 401-863-9182; e-mail: Roee Gutman (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, 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://www.brown.edu/academics/public-health/mph/curriculum](https://www.brown.edu/academics/public-health/mph/curriculum/).

**MPH Program Core Course Requirements**

**MPH Core Course Requirements**

Students must complete one of the following 2 course sequences in Biostatistics and Applied Data Analysis:

**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
- **PHP 2511** Applied Regression Analysis

Students must complete one of the following Epidemiology courses:

- **PHP 2120** Introduction to Methods in Epidemiologic Research
- **PHP 2150** Foundations in Epidemiologic Research Methods

Students must complete the following course:

- **PHP 2355** Designing and Evaluating Public Health Interventions

**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 also 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://www.brown.edu/academics/public-health/mph/mph-mpa](https://www.brown.edu/academics/public-health/mph/mph-mpa/)

**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.

The Master of Public Health (generalist) program has a 12 course credit requirement.

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

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 (6.5 during their first four years and 6.5 courses in the fifth year). For more information, please visit: [https://www.brown.edu/academics/public-health/mph/ugmph](https://www.brown.edu/academics/public-health/mph/ugmph).
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/.

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://biostats.brown.edu/program/

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

Required Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHP 2515</td>
<td>Fundamentals of Probability and Statistical Inference (OR )</td>
<td>1</td>
</tr>
<tr>
<td>PHP 2520</td>
<td>Statistical Inference I</td>
<td>1</td>
</tr>
<tr>
<td>PHP 2514</td>
<td>Applied Generalized Linear Models</td>
<td>1</td>
</tr>
<tr>
<td>PHP 2516</td>
<td>Applied Longitudinal Data Analysis</td>
<td>.5</td>
</tr>
<tr>
<td>PHP 2517</td>
<td>Applied Multilevel Data Analysis</td>
<td>.5</td>
</tr>
<tr>
<td>PHP 2550</td>
<td>Practical Data Analysis</td>
<td>1</td>
</tr>
<tr>
<td>PHP 2560</td>
<td>Statistical Programming with R</td>
<td>1</td>
</tr>
<tr>
<td>PHP 2610</td>
<td>Causal Inference and Missing Data</td>
<td>1</td>
</tr>
<tr>
<td>PHP 2650</td>
<td>Statistical Learning and Big Data</td>
<td>1</td>
</tr>
</tbody>
</table>

Electives (3 Courses)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHP 2030</td>
<td>Clinical Trials Methodology</td>
<td>1</td>
</tr>
<tr>
<td>PHP 2530</td>
<td>Bayesian Statistical Methods</td>
<td>1</td>
</tr>
<tr>
<td>PHP 2580</td>
<td>Statistical Inference II</td>
<td>1</td>
</tr>
<tr>
<td>PHP 2601</td>
<td>Linear Models</td>
<td>1</td>
</tr>
<tr>
<td>PHP 2602</td>
<td>Analysis of Lifetime Data</td>
<td>1</td>
</tr>
<tr>
<td>PHP 2605</td>
<td>Generalized Linear Models</td>
<td>1</td>
</tr>
<tr>
<td>PHP 2620</td>
<td>Statistical Methods in Bioinformatics, I</td>
<td>1</td>
</tr>
<tr>
<td>PHP 2980</td>
<td>Graduate Independent Study and Thesis Research</td>
<td>1-5</td>
</tr>
<tr>
<td>PHP 2120</td>
<td>Introduction to Methods in Epidemiologic Research</td>
<td>1</td>
</tr>
<tr>
<td>PHP 2561</td>
<td>Methods in Informatics and Data Science for Health</td>
<td>1</td>
</tr>
<tr>
<td>CSCI 1420</td>
<td>Machine Learning</td>
<td>1</td>
</tr>
<tr>
<td>CSCI 1470</td>
<td>Deep Learning</td>
<td>1</td>
</tr>
<tr>
<td>CSCI 1570</td>
<td>Design and Analysis of Algorithms</td>
<td>1</td>
</tr>
<tr>
<td>CSCI 1910</td>
<td>Computational Molecular Biology</td>
<td>1</td>
</tr>
</tbody>
</table>

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/.

For more information on admission, please visit: https://www.brown.edu/academics/public-health/admissions/.

Master's in CTR Requirements

Master's in CTR Requirements

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>PHP 2120</td>
<td>Introduction to Methods in Epidemiologic Research</td>
<td>1</td>
</tr>
<tr>
<td>PHP 2150</td>
<td>Foundations in Epidemiologic Research Methods</td>
<td>1</td>
</tr>
</tbody>
</table>

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

Sequence 1:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHP 2507</td>
<td>Biostatistics and Applied Data Analysis I</td>
<td></td>
</tr>
<tr>
<td>PHP 2508</td>
<td>BioStatistics and Data Analysis II</td>
<td></td>
</tr>
<tr>
<td>Or</td>
<td></td>
<td></td>
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</tbody>
</table>

Sequence 2:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHP 2510</td>
<td>Principles of Biostatistics and Data Analysis</td>
<td>1</td>
</tr>
<tr>
<td>PHP 2511</td>
<td>Applied Regression Analysis</td>
<td>1</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHP 1560</td>
<td>Statistical Programming in R</td>
<td>1</td>
</tr>
<tr>
<td>PHP 2030</td>
<td>Clinical Trials Methodology</td>
<td>1</td>
</tr>
<tr>
<td>PHP 2040</td>
<td>Survey Research Methods</td>
<td>1</td>
</tr>
<tr>
<td>PHP 2060</td>
<td>Qualitative Methods in Health Research</td>
<td>1</td>
</tr>
<tr>
<td>PHP 2180</td>
<td>Interpretation and Application of Epidemiology</td>
<td>1</td>
</tr>
<tr>
<td>PHP 2200</td>
<td>Intermediate Methods in Epidemiologic Research</td>
<td>1</td>
</tr>
</tbody>
</table>

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/
The degree may be completed on a part-time basis. Most full-time students complete the degree in two years, but who do not need or are not in a position to pursue the full Master’s Degree. Students interested in studying Global Public Health at the master’s level are strongly encouraged to apply to our research-intensive MPH program (https://www.brown.edu/academics/public-health/mph/).

For further information on admission and program requirements, please visit: https://www.brown.edu/academics/gradschool/programs/global-public-health (https://www.brown.edu/academics/gradschool/programs/global-public-health/)

The School is no longer accepting applications for the Sc.M. in Global Public Health. Students interested in studying Global Public Health at the master’s level are strongly encouraged to apply to our research-intensive MPH program (https://www.brown.edu/academics/public-health/mph/).

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 (https://www.brown.edu/academics/public-health/ctr/certificate/).

Certificate in CTR Course Requirements

<table>
<thead>
<tr>
<th>Certificate in CTR Course Requirements</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Research Methods (Students must complete one of the following courses)</td>
<td></td>
</tr>
<tr>
<td>PHP 2120 Introduction to Methods in Epidemiologic Research</td>
<td>1</td>
</tr>
<tr>
<td>PHP 2150 Foundations in Epidemiologic Research Methods</td>
<td>1</td>
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<tr>
<td>PHP 2300 Research Methods in Behavioral Science</td>
<td>1</td>
</tr>
<tr>
<td>Biostatistics and Applied Data Analysis (Students must complete both of the following courses)</td>
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<tr>
<td>PHP 2507 Biostatistics and Applied Data Analysis I</td>
<td>1</td>
</tr>
<tr>
<td>PHP 2508 BioStatistics and Data Analysis II</td>
<td>1</td>
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<tr>
<td>Students must complete one elective from the list found at <a href="https://www.brown.edu/academics/public-health/ctr/certificate">https://www.brown.edu/academics/public-health/ctr/certificate</a></td>
<td>3</td>
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<tr>
<td>Total Credits</td>
<td>12</td>
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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/)

Global Public Health Graduate Program

As with all educational programs in the School of Public Health, our Global Public Health ScM students learn public health by doing public health. Course work comes alive during an international fieldwork experience that fosters deep engagement and understanding of a global public health location. Academic and hands-on experiences culminate with a thesis project. Most full-time students complete the degree in two years, fulfilling the fieldwork requirement during the summer between academic years 1 and 2. The degree may be completed on a part-time basis.

- 12 courses, including 9 required courses and 3 electives
- 8-week international fieldwork experience
- Thesis project

For further information on admission and program requirements, please visit: https://www.brown.edu/academics/gradschool/programs/global-public-health (https://www.brown.edu/academics/gradschool/programs/global-public-health/)

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Courses

Generalist Public Health


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.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Fall GPHP2000 S01 18813 Arranged (A. Sullivan)</td>
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<tr>
<td>Fall GPHP2000 S02 18855 Arranged (A. Sullivan)</td>
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</table>
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 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 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.

This course provides 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.

This course will provide an overview of the methods and applications of therapy economics, biostatistics and epidemiology in the healthcare sector decision-making. Specific topics include: the application of therapy economics and economic evaluation to treatments, pharmacoeconomics and technology assessment; the assessment and interpretation of published epidemiological studies: institutional oversight of epidemiological studies as well as hands-on practice through weekly exercises and assignments.

GP 2010A. 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 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 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.

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.

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 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.

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HCL 2060. Quality Improvement and the Healthcare Learning Organization
In this course, students explore the quality improvement drivers, principles, systems, and tools that help create a healthcare learning organization. Students discover how quality improvement creates value, how to demonstrate the value of quality improvement to their colleagues, and how to ultimately develop a culture of learning within their organization. Students compare the learning needs of healthcare organizations to those in other industries. Students design and implement a quality improvement project within their own organization, and develop a "learning organization roadmap" for their organization.
Spr HCL2060  S01  26315 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.
Fall HCL2070  S01  17934 Arranged  (J. Coyne)

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.
Spr HCL2080  S01  26316 Arranged  'To Be Arranged'

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.
Spr HCL2090  S01  26313 Arranged  'To Be Arranged'

HCL 2100. Health Law
Explore current topics in health law with a focus on legal relationships among patients, providers, payers and institutions. Students will examine how the law regulates these relationships through professional regulation, informed consent, malpractice litigation and newer models of healthcare system accountability; by preventing fraud and abuse in payment for health care services, devices and pharmaceuticals; by reigning in anti-competitive practices in health care consolidation through antitrust law. In addition to exploring the role of law in regulating the health care system, students will consider broader legal and ethical issues in health and health care: access to care, discrimination and unequal treatment; bioethical issues such as the right to die, human reproduction, medical decision-making; how public health laws are evolving to address the realities of health in the U.S. and the global society: rising chronic disease, lower life-expectancy and pandemics like COVID-19.

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.
Spr HCL2110  S01  26314 Arranged  (I. Sadanah)

HCL 2120. Health Economics: Jargon, Theory, and Analytical Methods
This course provides a basic foundation in health economics: concepts, topics, cases and exercises are intended for healthcare leaders delivering, managing, regulating, and paying for care and healthcare products. This course provides a high-level overview and working knowledge of economic principles and methods applied in the healthcare sector. Applications to real healthcare delivery and financing issues are emphasized, with students gaining experience analyzing decisions related to choices underlying efficient and equitable production, allocation, and consumption of health care resources. Upon completion of this course, students possess a technical understanding of the theory, principles and methods of health economics as well as the ability to understand, interpret, critically review, and determine the economic repercussions of alternative health policies. Finally, students will be prepared to undertake economic evaluations of health-related projects, given real-world constraints of time, data, and budget.

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.
Spr HCL2130  S01  26312 Arranged  'To Be Arranged'

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  16361  TTh  1:00-2:20(06)  (N. Trivedi)
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.

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.

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 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.

**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 this course; this is a rigorous semester-long project. There are two exams.

**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 online setting intentionally requires students to engage in and learn about their own community 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 sociocultural and community-engaged approaches, 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 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 1313. Are We Really All in This Together? Culture, Structure, and Health Disparities.**
COVID-19 revealed the shared vulnerability of humankind to a microscopic pathogen. It also reminded us that the global burden of disease and health-related social problems are unevenly distributed, often tracking inequalities tied to race, class, and nation. This course brings together perspectives from public health and cultural anthropology to investigate and explain the underlying causes and consequences of the disparities associated with health crises around the world. Students will interrogate and learn to utilize polysemic theoretical concepts such as culture and structure, developing humanities-influenced perspectives regarding human wellbeing that can enhance public health research, practice, and outcomes.
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 SARS-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 public health response.

Fall PHP1450 S01 18435 T 4:00-6:30(07) (S. Rivkees)

PHP 1460. Public Health in a Changing World: Law, Policy & Justice. Laws and policies shape public health 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. Furthermore, 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 18436 TTh 9:00-10:20(05) (L. Tobin-Tyler)

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 16368 TTh 1:00-2:20(04) (A. Murillo)
Fall PHP1501 S02 18450 TTh 9:00-10:20(04) (J. Hogan)
Fall PHP1501 L02 16370 W 1:00-1:50 (A. Murillo)
Fall PHP1501 L04 16372 F 11:00-11:50 (A. Murillo)
Fall PHP1501 L05 18526 M 2:00-2:50 (A. Murillo)
Fall PHP1501 L06 18527 F 9:00-9:50 (A. Murillo)

PHP 1510. Principles of Biostatistics and Data Analysis.
This course is intended to provide a basic foundation in the methods and applications of biostatistics, and is geared towards the students whose fields of study include a substantial statistical or quantitative component. Ideally, this course is the first in a two-part sequence (the sequel being PHP 1511: Applied Regression), designed to provide students in the public health, biological and life sciences with broad-based exposure to modern methods of biostatistical inference, in addition to an understanding of underlying mathematical principles and motivations.

Fall PHP1510 S01 16373 TTh 10:30-11:50(13) (C. Schmid)

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.

Spr PHP1511 S01 25194 TTh 9:00-10:20(05) (A. Paul)

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 sociocultural 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 16377 M 3:00-5:30(03) (R. Cassidy)

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 16374 TTh 9:00-10:20(05) (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.

Spr PHP1600 S01 26785 M 3:00-5:30(13) (A. Dulin)
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
Spr PHP1610 S01 25195 T 1:30-4:00(11) (R. Cassidy)

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.
Spr PHP1650 S01 25196 W 3:00-5:30(10) "To Be Arranged"

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 16375 Th 2:30-3:50(12) (S. Skeels)
Fall PHP1680I S01 16375 TTh 2:30-3:50(12) (S. Skeels)

PHP 1680U. Intersectionality and Health Inequities. This course examines health inequities in the U.S. from an intersectionality perspective. Intersectionality is both a theory and methodology focused on the power dynamics between oppression and privilege and how various axes of social categories and systems interrelate on various and simultaneous levels. This framework critically examines how systemic injustice and social inequality transpire on a multidimensional basis. This course provides a broad overview of health disparities in the U.S., specifically, examining them through intersecting structural and social factors (e.g., race and ethnicity; gender; immigration status; socioeconomic position; age; sexual orientation; and the promise and limitations of public policy).
Spr PHP1680U S01 26418 Th 4:00-6:30(17) (M. Agénor)

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.
Fall PHP1690 S01 18437 Th 4:00-6:30(04) (T. Wray)

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.

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 17550 MW 8:30-9:50(09) (E. Walker)

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.
Fall PHP1730 S01 18436 T 4:00-6:30(07) (E. Tohn)

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.
Fall PHP1802S S01 16403 TTh 2:30-3:50(12) (A. Levine)
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.

Fall PHP1810 S01 18439 Th 4:00-6:30(04) (A. Tovar)

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 18537 M 3:00-5:30(03) (B. Brockmann)

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.

Spr PHP1854 S01 25198 MW 9:00-10:20(02) 'To Be Arranged'

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 16404 TTh 2:30-3:50(12) (E. Loucks)

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.

Spr PHP1885 S01 25205 M 3:00-5:30(13) (J. Brewer)

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 16405 W 3:00-5:30(10) (J. Brewer)

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.

Spr PHP1895 S01 25208 M 3:00-5:30(13) 'To Be Arranged'

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 16406 M 9:00-11:30(14) (A. Field)

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 16407 W 3:00-5:30(10) (L. Bohlen)

Fall PHP1910 S02 16408 W 3:00-5:30(10) (K. Konnyu)
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  18340  W  3:00-5:30(10)  (J. Ahluwalia)

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  16409  M  3:00-5:30(03)  (D. Grigsby)

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 socioeconomic status.

Open to graduate students and advanced undergraduates.

Fall PHP1950  S01  26419  T  9:00-11:30(05)  (A. Field)

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 examine 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.

Fall PHP1964  S01  16410  F  1:00-3:30(06)  (T. Zheng)

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.

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.

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  18380  MW  5:40-7:00(17)  (W. Goedel)

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 macrovascular 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.

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.

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  16411  Th  2:30-5:00(12)  (M. Silverstein)

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.

Spr PHP2024  S01  25209  TTh  2:30-3:50(11)  (P. Vivier)
Spr PHP2024  L01  25210  Th  4:00-5:30  (P. Vivier)

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.

Fall PHP2030  S01  16413  M  1:00-3:30(01)  (I. Saldanha)

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, and PHP 2508 or 2510. Open to graduate students only.

Spr PHP2040  S01  25212  M  3:30-6:00(13)  (M. Clark)
Laws and policies are implemented and enforced, affect health equity and individual rights and freedoms. What happens when public health intervention infringes on individual rights? Should the government have to compel individuals, groups and businesses to intervene to protect the public’s health, it also molds the social setting. The second course (PHP 2072) is taken in the Fall of your first year.

**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, 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, interpersonal 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.

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?

**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.

**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 patterns and determinants of human population health, with a goal of reducing the burden of disease, injury, and disability. An intensive first course in epidemiological methods, students learn core principles of study design and data analysis through critiques of published epidemiological studies as well as hands on practice through weekly 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.

**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, screening strategies, research misconduct and ethics, picking and managing mentors 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.
The overall objective of this course is to provide students with a strong foundation in epidemiologic research methods. This is the first of a two- or four-course sequence in epidemiologic methods aimed at students who expect to eventually conduct their own epidemiologic research. There will be a strong quantitative focus in this course. By the end of the foundations course, students should be sufficiently familiar with epidemiologic research methods to begin to apply these methods to their own work. Prerequisites: PHP 2507 or 2510 (either may be taken concurrently); the typical student will also have some introductory knowledge of epidemiology. Students not in a public health program who have met the prerequisites may request instructor permission (override) through CAB from the instructor. Fall PHP2150 S01 16418 TTh 10:30-11:50(13) (B. Marshall)

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. Fall PHP2180 S01 26428 Th 2:30-5:00(11) (A. Field)

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. Spr PHP2200 S01 26429 W 2:30-5:00(07) (N. Joyce)
Spr PHP2200 L01 26430 T 3:00-4:00 (N. Joyce)

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. Fall PHP2220B S01 18445 F 9:00-11:30(09) (S. Liu)

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 and Perinatal 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 16419 T 4:00-6:30(07) (A. Cartus)

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 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. Fall PHP2235 S01 18540 F 11:30-2:00(15) (M. Lurie)

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. Prerequisites: PHP 2200 and 2511; or PHP 2200 and 2508; or instructor permission. Fall PHP2250 S01 16420 TTh 1:00-2:20(06) (C. Howe)
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 16422  W 9:00-11:30(14)  (S. Rosenthal)

This course provides students with fundamental principles of behavioral and social research methodology for understanding the determinants of public health problems, and for executing and testing public health interventions. We will focus on experimental methods, observational studies, and qualitative approaches. We will develop skills in understanding and interpreting data—both quantitative and qualitative. Throughout the course we will emphasize ethical, cultural, and professional issues for designing public health interventions. Prior coursework in research methodology and quantitative methods is recommended but not required. Open to graduate students and advanced undergraduates. Enrollment limited to 15.
Fall PHP2300  S01 16453  Th 4:00-6:30(04)  (C. Kahler)

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 18958  T 12:00-2:30(06)  (B. Marcus)

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.
Fall PHP2330  S01 16433  W 2:30-5:00(10)  (K. Carey)

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. Undergraduates need permission of instructor; priority will be for Public Health concentrators. Enrollment limited to 25.
Fall PHP2340  S01 16431  W 9:30-12:00(14)  (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, affect and emotion 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 16432  MW 1:00-2:00(08)  (P. Risica)
Spr PHP2355  S01 26431  MW 1:00-2:00(06)  (T. Wray)
Spr PHP2355  S02 26432  Th 10:30-11:50(09)  (J. Hugho)

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
Spr PHP2360  S01 26590  W 1:00-3:30(06)  (B. Marcus)

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 16433  W 2:30-5:00(10)  (K. Carey)
PHP 2365. Public Health Issues in LGBT Populations. This seminar is designed for graduate students interested in health disparities and determinants of health in LGBT 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 LGBT 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 LGBT 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.

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 deliverables. 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 2401E. 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.

PHP 2410. 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 must be taken concurrently); and clinical background or training in basic concepts in medicine (must discuss with instructor).

PHP 2415. 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.

PHP 2440. Introduction to Pharmacoeconomics. The course will focus on substantive topics in pharmacoeconomics, including relevant principles of pharmacology, inference from spontaneous case reports, 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, police 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.
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.

Fall PHP2450  S01 16449 M  3:00-5:30(03) (M. Singh)

PHP 2451. Exchange Scholar Program.

Fall PHP2451  S01 15907 Arranged 'To Be Arranged'

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. The topics covered should be of interest to students in Health Services, Policy + Practice, Epidemiology, Economics, and beyond. Pre Requisites: Successful completion of PHP 2455A or instructor permission.

Fall PHP2455A S01 16450 M  1:00-3:30(03) (A. Bilinski)
Fall PHP2455A C01 16451 M  4:30-5:30 (A. Bilinski)

PHP 2455B. Health Services Research Methods II.
This course covers commonly used statistical (regression) models for health services research, including survival analysis; examines the problem of missing data and strategies for addressing it; and provides a basic introduction to causal inference methods for time-varying exposures (including non-adherence). The goal is to familiarize students with important methods in applied work, so they can critically review the published literature and use the methods in their own research. The topics covered should be of interest to students in Health Services, Policy + Practice, Epidemiology, Economics, and beyond. Pre Requisites: Successful completion of PHP 2455A or instructor permission.

Fall PHP2455B S01 26437 M  1:00-3:30(07) (D. Meyers)
Spr PHP2455B L01 26438 Th  4:30-5:30 'To Be Arranged'

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 may enroll after instructor approval).

Recommended course: DATA 1010, MATH 1610, or APMA 1690.
Fall PHP2465A S01 16452 W  1:00-3:30(01) (T. Trikalinos)

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.

Fall PHP2470 S01 18629 Th  3:30-5:00(12) (A. Trivedi)
Spr PHP2470 S01 26439 Th  3:30-5:00(11) 'To Be Arranged'

PHP 2480. Selected Topics in Global Health Economics.
This course will survey selected topics in global health economics. It is designed to introduce students to specific issues, theory and practice of health economics at the global level. The first part of the course will survey research papers on econometric methods in global health including: field experiments, instrumental variables, propensity score matching and regression discontinuity. The second part will discuss current topics such as: conditional economic incentives for providers and consumers, social health insurance, public goods, and externalities. Prerequisites: PHP 2511 and ECON 1110, or equivalent. Enrollment limited to 8 graduate students. Instructor permission required.

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 18960 TTh  9:00-10:20(05) (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 16434 Th  1:00-2:20(06) (A. Gjelsvik)
Fall PHP2507 S01 16434 W  6:30-8:00PM(06) (A. Gjelsvik)
Fall PHP2507 L01 17815 T  9:00-10:20 'To Be Arranged'
Fall PHP2507 L02 17816 T  5:30-6:50 'To Be Arranged'
Fall PHP2507 L03 17817 W  1:00-2:20 'To Be Arranged'
Fall PHP2507 L04 17818 W  5:00-6:20 'To Be Arranged'
Fall PHP2507 L05 17819 T  3:00-4:20 'To Be Arranged'
Fall PHP2507 L06 17620 Arranged 'To Be Arranged'

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.

Spr PHP2508 S01 25966 Th  1:00-2:20(08) (A. Gjelsvik)
Spr PHP2508 S01 25966 W  6:30-8:00PM(08) (A. Gjelsvik)
Spr PHP2508 L01 25967 T  9:00-10:20 (A. Gjelsvik)
Spr PHP2508 L02 25968 T  5:30-6:50 (A. Gjelsvik)
Spr PHP2508 L03 25969 W  9:30-10:50 (A. Gjelsvik)
Spr PHP2508 L04 25970 W  5:00-6:20 (A. Gjelsvik)
Spr PHP2508 L05 26234 T  3:00-4:20 (A. Gjelsvik)
Spr PHP2508 L06 26235 Arranged (A. Gjelsvik)
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. Undergraduates are encouraged to enroll in PHP1510.
Fall PHP2510 S01 16435 TTh 9:00-10:20(05) (S. Dunsiger)

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.
Spr PHP2511 S01 25965 TTh 9:00-10:20(05) (A. Murillo)

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 16454 TTh 1:00-2:20(06) (S. Chrysantheopoulou)

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 16455 MW 9:00-10:20(09) (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 R. Prereq is: PHP 2511 or PHP 2514; PHP 2508 with Permission from Instructor.
Spr PHP2516 S01 26441 MW 9:00-10:20(02) (A. Murillo)

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.
Spr PHP2517 S01 26442 MW 9:00-10:20(02) (A. Murillo)

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 16456 MW 9:00-10:20(09) (Z. Wu)

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.
Spr PHP2530 S01 26443 TTh 1:00-2:20(08) (R. Gutman)

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 R programming language.
Fall PHP2550 S01 16457 MW 10:30-11:50(16) (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 16458 TTh 9:00-10:20(05) (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 biophysical 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.
Spr PHP2561 S01 26444 M 3:00-5:30(13) (E. Chen)
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.
Spr PHP2580 S01 26445 MW 10:30-11:50(03) (C. Gatsonis)

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. Concepts will be developed through examples, emphasizing proper analysis of each design. Students should have knowledge of probability and statistical inference, regression analysis and familiarity with R programming. While specific courses are not prerequisites, courses that would satisfy these requirements are PHP 2510/2511, PHP 2515/2514 and PHP 2560. Those unsure about their preparation should consult the instructor.
Spr PHP2590 S01 27167 MW 1:00-2:20 (C. Schmid)

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 16459 TTh 1:00-2:20(06) (R. DeVito)

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.
Spr PHP2602 S01 26661 TTh 2:30-3:50(11) (J. Steingrimsson)

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 MATH3052), knowledge of regression analysis (at the level of PHP2511) and knowledge of R.
Spr PHP2605 S01 26446 MW 1:00-2:20(06) (A. Eloyan)

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 16460 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.
Spr PHP2620 S01 26449 Th 10:30-11:50(09) (A. Paul)

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. Design of

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.

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 16443 M 1:00-3:30(01) (K. Andes)
PHP 2720. Implementing Public Health Programs and Interventions in the Global South.
This course will focus on the theory and methods related to increasing the impact of evidence-based public health interventions and the effectiveness of healthcare delivery in diverse resource-limited settings across the globe. This course will focus on the influence of social, structural, political, and organizational processes on the development, implementation, adaptation, and evaluation of public health interventions in the Global South. We will review the emerging field of implementation science and critically analyze approaches for the evaluation of ongoing global public health programs.

Fall PHP2720 S01 16442 F 9:00-11:30(14) (J. Pellow)

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.

Spr PHP2730 S01 25971 T 10:00-12:30(09) (M. Doshi)

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.

Spr PHP2740 S01 25972 M 2:30-5:00(13) (A. Harrison)

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.

Fall PHP2760 S01 16441 W 9:00-11:30(16) (A. Harrison)

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 16437 M 4:00-4:50(04) (A. Eloyan)
Fall PHP2950 S02 16438 F 1:00-1:50(04) (A. Dulin)
Fall PHP2950 S03 16439 T 12:00-12:50(04) (F. Beaudoin)
Fall PHP2950 S04 16440 M 12:00-12:50(04) (A. Bilinski)
Spr PHP2950 S01 25973 T 12:00-12:50(13) (F. Beaudoin)
Spr PHP2950 S02 25974 M 12:00-12:50(13) "To Be Arranged"
Spr PHP2950 S03 25975 F 1:00-1:50(13) "To Be Arranged"
Spr PHP2950 S04 25976 M 4:00-4:50(13) "To Be Arranged"

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 15908 Arranged "To Be Arranged"
Spr PHP2990 S01 24713 Arranged "To Be Arranged"

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