The School of Public Health

Dean
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Department Chair - Behavioral and Social Sciences
Christopher W. Kahler

Department Chair - Biostatistics
Christopher H. Schmid

Interim Department Chair - Epidemiology
David A. Savitz

Department Chair - Health Services, Policy & Practice
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 based upon its commitment to serve the community, the nation, and the world by training future public health leaders and discovering and communicating innovative approaches to addressing public health challenges. Our commitment extends to enhancing population health and overall well-being by working with the broader public health community to:

- Advance knowledge on population health through an understanding of risk and protective factors throughout the human lifespan
- Develop evidence about effective medical and public health interventions
- Evaluate and disseminate strategies to encourage healthy behaviors
- Improve health care by identifying effective policies and practices

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; ScM in Global Public Health; 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>
</tr>
</thead>
<tbody>
<tr>
<td>PHP 0310</td>
<td>Health Care in the United States</td>
</tr>
<tr>
<td>PHP 0320</td>
<td>Introduction to Public Health</td>
</tr>
<tr>
<td>PHP 0850</td>
<td>Fundamentals of Epidemiology</td>
</tr>
<tr>
<td>PHP 1501</td>
<td>Essentials of Data Analysis</td>
</tr>
<tr>
<td>PHP 1910</td>
<td>Public Health Senior Seminar</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>
</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 Darn High?</td>
</tr>
<tr>
<td>PHP 1100</td>
<td>Comparative Health Care Systems</td>
</tr>
<tr>
<td>PHP 1480</td>
<td>Introduction To Public Health Economics</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 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 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 1680U</td>
<td>Intersectionality and Health Inequities</td>
</tr>
<tr>
<td>PHP 1690</td>
<td>Technology and Health Behavior Change</td>
</tr>
<tr>
<td>PHP 1920</td>
<td>Social Determinants of Health</td>
</tr>
</tbody>
</table>

5. Global Health Elective (select one of the following):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHP 0700</td>
<td>Global Public Health Interventions</td>
</tr>
<tr>
<td>PHP 0720</td>
<td>Public Health and the Environment</td>
</tr>
<tr>
<td>PHP 1070</td>
<td>The Burden of Disease in Developing Countries</td>
</tr>
<tr>
<td>PHP 1160</td>
<td>The Global Burden of Mental Illness: A Public Health Approach</td>
</tr>
<tr>
<td>PHP 1400</td>
<td>HIV/AIDS in Africa: A Multidisciplinary Approach to Support HIV/AIDS Care and Treatment Programs</td>
</tr>
<tr>
<td>PHP 1802S</td>
<td>Human Security and Humanitarian Response: Increasing Effectiveness and Accountability</td>
</tr>
</tbody>
</table>

6. Health Disparities Elective (select one of the following):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHP 1680I</td>
<td>Pathology to Power: Disability, Health and Community</td>
</tr>
<tr>
<td>PHP 1680U</td>
<td>Intersectionality and Health Inequities</td>
</tr>
<tr>
<td>PHP 1820</td>
<td>Designing Education for Better Prisoner and Community Health</td>
</tr>
<tr>
<td>PHP 1920</td>
<td>Social Determinants of Health</td>
</tr>
</tbody>
</table>

7. Biology (select one of the following):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 0200</td>
<td>The Foundation of Living Systems</td>
</tr>
<tr>
<td>BIOL 0470</td>
<td>Genetics</td>
</tr>
<tr>
<td>BIOL 0510</td>
<td>Introductory Microbiology</td>
</tr>
</tbody>
</table>

The School of Public Health
The School of Public Health

BIOL 0530 Principles of Immunology
BIOL 0800 Principles of Physiology

8. Humanities/Fine Arts/Humanistic Social Sciences for Public Health (select one of the following):

AFRI 0550 African American Health Activism from Emanicipation to AIDS
AFRI 1060W Policy, Culture and Discourse that Shape Health and Access to Healthcare
AFRI 1060Z Race, Sexuality, and Mental Disability History (HMAN 1973A)
AMST 1600C The Anti-Trafficking Savior Complex: Saints, Sinners, and Modern-Day Slavery
AMST 1601 Health and Healing in American History (STS 1110, GNSS 1960B)
CLPS 0710 The Psychology and Philosophy of Happiness (PHIL 0650)
COLT 0610Y Women’s Writing in the Arab World
COLT 1810P Literature and Medicine
COST 0100 Introduction to Contemplative Studies
ENGL 1030C Writing Science
ENGL 1140D Writing Diversity
ETHN 1750B Treaty Rights and Food Fights: Eating Local in Indian Country
ETHN 1890J Native American Environmental Health Movements
GNSS 0090C Reproductive Health: Science and Politics
GNSS 0120 Introduction to Gender and Sexuality Studies
GNSS 1961H Literary Imaginations of the Law: Human Rights and Literature
HISP 0490A Spanish for Health Care Workers
HISP 0750Q Health, Illness and Medicine in Spanish and Spanish American Literature and Film
HIST 0150H Foods and Drugs in History
HIST 0270B From the Columbian Exchange to Climate Change: Modern Global Environmental History
HIST 0286A History of Medicine I: Medical Traditions in the Old World Before 1700
HIST 0537B Tropical Delights: Imagining Brazil in History and Culture
HIST 1080 Humanitarianism and Conflict in Africa
HIST 1830M From Medieval Bedlam to Prozac Nation: Intimate Histories of Psychiatry and Self
HIST 1960Q Medicine and Public Health in Africa
HIST 1972H U.S. Human Rights in a Global Age
HIST 1977I Gender, Race, and Medicine in the Americas
HMAN 1970G International Perspectives on NGOs, Public Health, and Health Care Inequalities
LACA 1503H Sexuality, Human Rights and Health: Latin American Perspective and Brazilian Experiences
HMAN 1973P Neurodiversity
LITR 1151T Poetry for Healing Territories
PHIL 0060 Modern Science and Human Values
PHIL 0260 Philosophy of Social Science
PHIL 0390 Global Justice
POBS 1501E Histories of Global Health from Lusophone Africa: Biomedical Actions in Angola, Mozambique, Guinea
RELS 0250 Bodily Practice and Religion

TAPS 1281W Artists and Scientists as Partners
TAPS 1281Z Artists and Scientists as Partners: Theory to Practice

Total Credits 12

Requirements for Classes of 2021 and 2022

1. Core Courses: (non-substitutable; 4 required for honors, 5 for non-honors)

PHP 0310 Health Care in the United States
This course is best taken as a freshman or sophomore.

PHP 0320 Introduction to Public Health
This course is a prerequisite to the Fundamentals of Epidemiology (PHP 0850) and is best taken as a freshman or sophomore.

PHP 0850 Fundamentals of Epidemiology
This course is best taken by end of junior year before PHP 1910, Senior Seminar.

PHP 1501 Essentials of Data Analysis
This course is best taken by end of junior year before PHP 1910, Senior Seminar.

PHP 1910 Public Health Senior Seminar
This course is required for all non-honors seniors. PHP 0320 and PHP 0310 are required prerequisites.

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

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

PHP 1700 Current Topics in Environmental Health

PHP 1710 Climate Change and Human Health

AMST 1700I Community Engagement with Health and the Environment

BIOL 1820 Environmental Health and Disease

ENVS 0705 Equity and the Environment: Movements, Scholarship, Solutions

ENVS 1580 Environmental Stewardship and Resilience in Urban Systems

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

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

PHP 1070 The Burden of Disease in Developing Countries

PHP 1100 Comparative Health Care Systems

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

PHP 1820 Designing Education for Better Prisoner and Community Health

ECON 1360 Health Economics

IAPA 1804E Health Policy Challenges

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

PHP 1010 Doctors and Patients: Clinical Communication in Medicine

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

PHP 1540 Alcohol Use and Misuse

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

PHP 1610 Tobacco, Disease and the Industry: cigs, e-cigs and more
5. Biology (Select one of the following)
Note that AP Biology does not exempt students from this requirement. Most students will likely take BIOL 0200. Students who place out of BIOL 0200 with AP credit can choose one of the other four (4) courses.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 0200</td>
<td>The Foundation of Living Systems</td>
</tr>
<tr>
<td>BIOL 0470</td>
<td>Genetics</td>
</tr>
<tr>
<td>BIOL 0510</td>
<td>Introductory Microbiology</td>
</tr>
<tr>
<td>BIOL 0530</td>
<td>Principles of Immunology</td>
</tr>
<tr>
<td>BIOL 0800</td>
<td>Principles of Physiology</td>
</tr>
</tbody>
</table>

6. Humanities/Fine Arts/Humanistic Social Sciences Course for Public Health (Select one of the following)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFRI 0550</td>
<td>African American Health Activism from Emancipation to AIDS</td>
</tr>
<tr>
<td>AFRI 1060W</td>
<td>Policy, Culture and Discourse that Shape Health and Access to Healthcare</td>
</tr>
<tr>
<td>AFRI 1060Z</td>
<td>Race, Sexuality, and Mental Disability History</td>
</tr>
<tr>
<td>AMST 1600C</td>
<td>The Anti-Trafficking Savior Complex: Saints, Sinners, and Modern-Day Slavery</td>
</tr>
<tr>
<td>AMST 1601</td>
<td>Health and Healing in American History</td>
</tr>
<tr>
<td>COST 0100</td>
<td>Introduction to Contemplative Studies</td>
</tr>
<tr>
<td>ENGL 1030C</td>
<td>Writing Science</td>
</tr>
<tr>
<td>ETHN 1750B</td>
<td>Treaty Rights and Food Rights: Eating Local in Indian Country</td>
</tr>
<tr>
<td>ETHN 1890J</td>
<td>Native American Environmental Health Movements</td>
</tr>
<tr>
<td>GNSS 0090C</td>
<td>Reproductive Health: Science and Politics</td>
</tr>
<tr>
<td>GNSS 0120</td>
<td>Introduction to Gender and Sexuality Studies</td>
</tr>
<tr>
<td>GNSS 1961H</td>
<td>Literary Imaginations of the Law: Human Rights and Literature</td>
</tr>
<tr>
<td>HISP 0490A</td>
<td>Spanish for Health Care Workers</td>
</tr>
<tr>
<td>HISP 0750Q</td>
<td>Health, Illness and Medicine in Spanish and Spanish American Literature and Film</td>
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<td>HIST 0150H</td>
<td>Foods and Drugs in History</td>
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<tr>
<td>HIST 0270B</td>
<td>From the Columbian Exchange to Climate Change: Modern Global Environmental History</td>
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<tr>
<td>HIST 0286A</td>
<td>History of Medicine I: Medical Traditions in the Old World Before 1700</td>
</tr>
<tr>
<td>HIST 1080</td>
<td>Humanitarianism and Conflict in Africa</td>
</tr>
<tr>
<td>HIST 1830M</td>
<td>From Medieval Bedlam to Prozac Nation: Intimate Histories of Psychiatry and Self</td>
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<tr>
<td>HIST 1977I</td>
<td>Gender, Race, and Medicine in the Americas</td>
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<tr>
<td>HIST 1960Q</td>
<td>Medicine and Public Health in Africa</td>
</tr>
<tr>
<td>HIST 1972H</td>
<td>U.S. Human Rights in a Global Age</td>
</tr>
<tr>
<td>HMAN 1970G</td>
<td>International Perspectives on NGOs, Public Health, and Health Care Inequalities</td>
</tr>
<tr>
<td>LACA 1503H</td>
<td>Sexuality, Human Rights and Health: Latin American Perspective and Brazilian Experiences</td>
</tr>
<tr>
<td>PHIL 0060</td>
<td>Modern Science and Human Values</td>
</tr>
</tbody>
</table>

7. General Electives (Class of 2021: Select two)
General electives may be selected from: A. All PHP and BIOL course offerings; B. the approved content area electives (#2, #3, #4, and #5) listed above; or C. the approved general electives listed below. No more than one (1) BIOL course can count as a general elective.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHP 1400</td>
<td>HIV/AIDS in Africa: A Multidisciplinary Approach to Support HIV/AIDS Care and Treatment Programs</td>
</tr>
<tr>
<td>PHP 1680I</td>
<td>Pathology to Power: Disability, Health and Community</td>
</tr>
<tr>
<td>AFRI 1060W</td>
<td>Policy, Culture and Discourse that Shape Health and Access to Healthcare</td>
</tr>
<tr>
<td>AMST 1601</td>
<td>Health and Healing in American History</td>
</tr>
<tr>
<td>AMST 1906P</td>
<td>Food in American Society and Culture</td>
</tr>
<tr>
<td>ANTH 0110</td>
<td>Anthropology and Global Social Problems: Environment, Development, and Governance</td>
</tr>
<tr>
<td>ANTH 0300</td>
<td>Culture and Health</td>
</tr>
<tr>
<td>ANTH 1020</td>
<td>AIDS in Global Perspective</td>
</tr>
<tr>
<td>ANTH 1242</td>
<td>Bioethics and Culture</td>
</tr>
<tr>
<td>ANTH 1300</td>
<td>Anthropology of Addictions and Recovery</td>
</tr>
<tr>
<td>ANTH 1310</td>
<td>International Health: Anthropological Perspectives</td>
</tr>
<tr>
<td>BIOL 0030</td>
<td>Principles of Nutrition (Human Biology/Physiology course)</td>
</tr>
<tr>
<td>BIOL 0040</td>
<td>Nutrition for Fitness and Physical Activity</td>
</tr>
<tr>
<td>BIOL 0140K</td>
<td>Conservation Medicine</td>
</tr>
<tr>
<td>BIOL 0180</td>
<td>The Biology of AIDS</td>
</tr>
<tr>
<td>BIOL 0190E</td>
<td>Botanical Roots of Modern Medicine</td>
</tr>
<tr>
<td>BIOL 0200</td>
<td>The Foundation of Living Systems (Human Biology/Physiology course)</td>
</tr>
<tr>
<td>BIOL 0470</td>
<td>Genetics (Human Biology/Physiology course)</td>
</tr>
<tr>
<td>BIOL 0530</td>
<td>Principles of Immunology (Human Biology/Physiology course)</td>
</tr>
<tr>
<td>BIOL 0800</td>
<td>Principles of Physiology (Human Biology/Physiology course)</td>
</tr>
<tr>
<td>BIOL 0860</td>
<td>Diet and Chronic Disease</td>
</tr>
<tr>
<td>BIOL 0920A</td>
<td>Controversies in Medicine (Human Biology/Physiology course)</td>
</tr>
<tr>
<td>BIOL 1920C</td>
<td>Social Contexts of Disease</td>
</tr>
<tr>
<td>CLPS 0700</td>
<td>Social Psychology</td>
</tr>
<tr>
<td>CLPS 1700</td>
<td>Abnormal Psychology</td>
</tr>
<tr>
<td>CLPS 1783</td>
<td>Nudge: How to Use Social Psychology to Create Social Change</td>
</tr>
<tr>
<td>ECON 0510</td>
<td>Development and the International Economy</td>
</tr>
<tr>
<td>EDUC 0800</td>
<td>Introduction to Human Development and Education</td>
</tr>
<tr>
<td>ENV 0490</td>
<td>Environmental Science in a Changing World</td>
</tr>
<tr>
<td>ENV 1105</td>
<td>Introduction to Environmental GIS</td>
</tr>
</tbody>
</table>
Statistics Concentration Requirements

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

The Concentration is based on several premises: that statistics is a scientific discipline in its own right, with specialized methodologies and body of knowledge; that it is essentially concerned with the art and science of data analysis; and that it is best taught in conjunction with specific, substantive applications. To this end, the Concentration is designed to provide foundations that include basic statistical concepts and methodologies, and to expose students to the role of statistical thinking and analysis in interdisciplinary research and in the public sphere. The Concentration prepares students for careers in industry and government, for graduate study in statistics or biostatistics and other sciences, as well as for professional study in law, medicine, business, or public administration. The undergraduate concentration guide is available here (https://www.brown.edu/academics/public-health/biostatistics/undergraduate-statistics-concentration/).

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

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

**LEVEL I - Foundations in Mathematics - Calculus**

- MATH 0100 Introductory Calculus, Part II
- MATH 0180 Intermediate 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

With the approval of the Director of the Statistics Concentration, one of the following courses may serve as replacement:

- SOC 1100 Introductory Statistics for Social Research
- ECON 1620 Introduction to Econometrics

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<table>
<thead>
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<th>Course Code</th>
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<tbody>
<tr>
<td>ETHN 1890J</td>
<td>Native American Environmental Health Movements</td>
</tr>
<tr>
<td>GNSS 0090C</td>
<td>Reproductive Health: Science and Politics</td>
</tr>
<tr>
<td>HMAN 1970G</td>
<td>International Perspectives on NGOs, Public Health, and Health Care Inequalities</td>
</tr>
<tr>
<td>NEUR 0010</td>
<td>The Brain: An Introduction to Neuroscience (Human Biology/Physiology course)</td>
</tr>
<tr>
<td>NEUR 0700</td>
<td>Psychoactive Drugs and Society</td>
</tr>
<tr>
<td>IAPA 1700E</td>
<td>Nonprofit Organizations</td>
</tr>
<tr>
<td>IAPA 1700F</td>
<td>Engaged Research Engaged Publics</td>
</tr>
<tr>
<td>IAPA 1803E</td>
<td>Social Entrepreneurship</td>
</tr>
<tr>
<td>POLS 1740</td>
<td>Politics of Food</td>
</tr>
<tr>
<td>SOC 0230</td>
<td>Sex, Gender, and Society</td>
</tr>
<tr>
<td>SOC 0300B</td>
<td>Environment and Society</td>
</tr>
<tr>
<td>SOC 0300E</td>
<td>HIV/AIDS: Politics, Culture and Society</td>
</tr>
<tr>
<td>SOC 0300F</td>
<td>Unequal From Birth: Child Health From a Social Perspective</td>
</tr>
<tr>
<td>SOC 0300K</td>
<td>Inequalities and Health</td>
</tr>
<tr>
<td>SOC 1250</td>
<td>Perceptions of Mental Illness</td>
</tr>
<tr>
<td>SOC 1315</td>
<td>Macro-Organizational Theory: Organizations in Social Context</td>
</tr>
<tr>
<td>SOC 1410</td>
<td>Aging and the Quality of Life</td>
</tr>
<tr>
<td>SOC 1540</td>
<td>Human Needs and Social Services</td>
</tr>
<tr>
<td>SOC 1550</td>
<td>Sociology of Medicine</td>
</tr>
<tr>
<td>SOC 1870D</td>
<td>Aging and Social Policy</td>
</tr>
<tr>
<td>SOC 1871H</td>
<td>Social Perspectives on HIV/AIDS</td>
</tr>
<tr>
<td>SOC 1871N</td>
<td>Military Health: The Quest for Healthy Violence</td>
</tr>
<tr>
<td>STS 0700B</td>
<td>Science and Social Controversy</td>
</tr>
<tr>
<td>STS 1700C</td>
<td>Science and Technology Policy in the Global South</td>
</tr>
<tr>
<td>UNIV 0090</td>
<td>Meditation and the Brain: Applications in Basic and Clinical Science</td>
</tr>
</tbody>
</table>

### Total Credits: 12

**Honors:**

**Honors Track, Classes of 2021 & 2022**

An Honors track is available for students who qualify. For Classes of 2021 & 2022, Honors track students do not enroll in PHP 1910, Senior Seminar during the Fall semester of their senior year, but rather are required to enroll in PHP 1980 for both semesters of their senior year to conduct research and write the honors thesis. Thus, for Classes of 2021 & 2022, thirteen courses are required for completion of the concentration requirements for an honors track student.

**Honors Track, Classes of 2023 & Beyond**

For Classes of 2023 & beyond, Honors track students enroll in PHP 1910, Senior Seminar during Fall semester of their senior year as well as PHP 1980. Honors Thesis Prep during both semesters of their senior year to conduct research and write the honors thesis. Thus, for Classes of 2023 & beyond, fourteen courses are required for completion of the concentration requirements for an honors track student.

Please visit https://www.brown.edu/academics/public-health/undergraduate/curriculum (https://www.brown.edu/academics/public-health/undergraduate/curriculum/) for details or email Elizabeth Mellen (elizabeth_mellen@brown.edu) for more information.

**Study Abroad/Study Away:** Up to four courses taken elsewhere (study abroad or other transfer) may be applied to non-core courses (up to two per semester abroad). Meet with your concentration adviser to discuss and provide a syllabus for each course to be considered for transfer to your concentration plan.
Capstone Project

APMA 1710 Information Theory
APMA 1740 Recent Applications of Probability and Statistics
APMA 1860 Graphs and Networks
APMA 2610 Recent Applications of Probability and Statistics
ENGN 2520 Pattern Recognition and Machine Learning
CLPS 1292 Introduction to Programming for the Mind, Brain and Behavior
CLPS 1492 Computational Cognitive Neuroscience
ECON 1360 Health Economics
ECON 1630 Mathematical Econometrics I
ECON 1640 Mathematical Econometrics II
ECON 1660 Big Data
MATH 1810A Applied Algebraic Topology

Other Analytical/Computational/Statistical courses with the approval of the Director of the Statistics Concentration

Total Credits 13

Prospective students will be able to obtain Advanced Placement credit for the requirements in mathematics. Students who have already completed an introductory course in statistics will be granted permission to proceed to Level II core courses if they meet the prerequisites in mathematics and computing.

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

**Senior Thesis:** A senior honors thesis is not a requirement for graduation, but concentrators who choose to write one are required to write a manuscript that describes a major project of statistical data analysis that they performed or a simulation study to evaluate the performance of a statistical method. Students who decide to write an honor thesis will generally integrate their capstone project into their thesis. Generally, writing a senior thesis includes two semesters of independent study (PHP 1970/1980), 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 14 course requirement (12 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 3 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

Students must complete the following two half credit courses:

- PHP 2071 Applied Public Health: Systems and Practice
- PHP 2072 Applied Public Health: Policy, leadership and communication

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 13 total course credits toward the MPH (5.5 during their first four years and 7.5 courses in the fifth year). For more information, please visit: https://www.brown.edu/academics/public-health/ugmph (https://www.brown.edu/academics/public-health/ugmph/).

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

The School of Public Health and the Watson Institute for International and Public Affairs 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 21 courses (13 full courses and 8 half courses) as well as an internship, a Global Policy Experience (required, non-credit) 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/mpm/mpa (https://www.brown.edu/academics/public-health/mpm/mpa/)

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.


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

Required courses for the Biostatistics Master's degree program are listed below. Additional details can be found on the Department's webpage: https://www.brown.edu/biostatistics (https://www.brown.edu/academics/public-health/biostats/).

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

Required Courses

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

Electives (3 Courses)

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

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:

The Department is no longer accepting applications for the Sc.M. in Behavioral and Social Health Sciences. Students interested in studying Health Behavior at the master's level are strongly encouraged to apply to our research-intensive MPH program.

**Master's in BSHS Required Core Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHP 2300</td>
<td>Research Methods in Behavioral Science</td>
</tr>
<tr>
<td>PHP 2340</td>
<td>Behavioral and Social Science Theory for Health Promotion</td>
</tr>
<tr>
<td>PHP 2360</td>
<td>Developing + Testing Theory-Driven, Evidence Based Psychosocial and Behavioral Health Interventions</td>
</tr>
<tr>
<td>PHP 2380</td>
<td>Health Communication</td>
</tr>
</tbody>
</table>

**Electives: Must take 3 from this list**

1. PHP 1070 | The Burden of Disease in Developing Countries
2. ANTH 1300 | Anthropology of Addictions and Recovery
3. PHP 1400 | HIV/AIDS in Africa: A Multidisciplinary Approach to Support HIV/AIDS Care and Treatment Programs
4. PHP 1540 | Alcohol Use and Misuse
5. PHP 1600 | Obesity in the 21st Century: Causes, Consequences and Countermeasures
6. PHP 1740 | Principles of Health Behavior and Health Promotion Interventions
7. PHP 1880 | Meditation, Mindfulness and Health
8. PHP 1920 | Social Determinants of Health
9. PHP 2030 | Clinical Trials Methodology
10. PHP 2040 | Survey Research Methods
11. PHP 2060 | Qualitative Methods in Health Research
12. PHP 2120 | Introduction to Methods in Epidemiologic Research
13. PHP 2130 | Human Biology for Public Health
14. PHP 2220C | Perinatal Epidemiology: Women and Infants’ Health during Pregnancy in a Global Context
15. PHP 2325 | Place Matters: Exploring Community-Level Contexts on Health Behaviors, Outcomes and Disparities
16. PHP 2365 | Public Health Issues in LGBT Populations
17. PHP 2370 | Etiology of Substance Use Disorders
18. PHP 2371 | Psychosocial and Pharmacologic Treatment of Substance Use Disorders
20. PHP 2980 | Graduate Independent Study and Thesis Research

Additional electives may be considered and are subject to approval by the BSS curriculum committee. Students wishing to take an elective that is not listed should consult with their adviser and complete a Curriculum Appeal Form.

This course has substantial overlap with PHP 2360; please consult your adviser.

Students have the option of enrolling in a Graduate Independent Study as an elective course under the instruction of their thesis adviser. Please choose the section that has your adviser listed as the instructor and have an override code ready in order to register.

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

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

**Master's in CTR Requirements**

**Master's in CTR Requirements**

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

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

- **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

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

- PHP 1560 | Statistical Programming in R
- PHP 2030 | Clinical Trials Methodology
- PHP 2040 | Survey Research Methods
- PHP 2060 | Qualitative Methods in Health Research
- PHP 2180 | Interpretation and Application of Epidemiology
- PHP 2410E | Medicare: A Data Based Policy Examination
- PHP 2415 | Introduction to Evidence-based Medicine
- PHP 2465A | Introduction to Health Decision Analysis

Scientific Writing (Students must complete the following course)

- PHP 2090 | Research Grant Writing for Public Health

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

- PHP 2470 | Topics in Clinical, Translational and Health Services Research

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

The Certificate in Clinical and Translational Research is designed for trainees who need a more structured and intensive experience than can be obtained from taking one or two courses as a special student,
but 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

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

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHP 2120</td>
<td>Introduction to Methods in Epidemiologic Research</td>
</tr>
<tr>
<td>PHP 2150</td>
<td>Foundations in Epidemiologic Research Methods</td>
</tr>
<tr>
<td>PHP 2300</td>
<td>Research Methods in Behavioral Science</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHP 2507</td>
<td>Biostatistics and Applied Data Analysis I</td>
</tr>
<tr>
<td>PHP 2508</td>
<td>Biostatistics and Applied Data Analysis II</td>
</tr>
</tbody>
</table>

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

Epidemiology Graduate Program

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

The Department is no longer accepting applications for the Sc.M. in Epidemiology. Students interested in studying Epidemiology at the master's level are strongly encouraged to apply to our research-intensive MPH program.

For more information on admission and program requirements, please visit: http://www.brown.edu/academics/gradschool/programs/epidemiology-0 (http://www.brown.edu/academics/gradschool/programs/epidemiology-0/)

Master's in Epidemiology Required Courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHP 2150</td>
<td>Foundations in Epidemiologic Research Methods</td>
</tr>
<tr>
<td>PHP 2200</td>
<td>Intermediate Methods in Epidemiologic Research</td>
</tr>
<tr>
<td>PHP 2130</td>
<td>Human Biology for Public Health</td>
</tr>
</tbody>
</table>

AND at least two of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHP 2030</td>
<td>Clinical Trials Methodology</td>
</tr>
<tr>
<td>PHP 2040</td>
<td>Survey Research Methods</td>
</tr>
<tr>
<td>PHP 2180</td>
<td>Interpretation and Application of Epidemiology</td>
</tr>
<tr>
<td>PHP 220B</td>
<td>Nutritional Epidemiology</td>
</tr>
<tr>
<td>PHP 2250</td>
<td>Advanced Quantitative Methods in Epidemiologic Research</td>
</tr>
<tr>
<td>PHP 2260</td>
<td>Applied Epidemiologic Data Analysis</td>
</tr>
<tr>
<td>PHP 2440</td>
<td>Introduction to Pharmacoepidemiology</td>
</tr>
<tr>
<td>PHP 245A</td>
<td>Health Services Research Methods I</td>
</tr>
<tr>
<td>PHP 245B</td>
<td>Health Services Research Methods II</td>
</tr>
<tr>
<td>PHP 246A</td>
<td>Introduction to Health Decision Analysis</td>
</tr>
<tr>
<td>PHP 2520</td>
<td>Statistical Inference I</td>
</tr>
<tr>
<td>PHP 2530</td>
<td>Bayesian Statistical Methods</td>
</tr>
<tr>
<td>PHP 2550</td>
<td>Practical Data Analysis</td>
</tr>
<tr>
<td>PHP 2560</td>
<td>Statistical Programming with R</td>
</tr>
<tr>
<td>PHP 2601</td>
<td>Linear Models</td>
</tr>
</tbody>
</table>

Required Biostatistics Courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHP 2602</td>
<td>Analysis of Lifetime Data</td>
</tr>
<tr>
<td>PHP 2610</td>
<td>Causal Inference and Missing Data</td>
</tr>
<tr>
<td>PHP 2620</td>
<td>Statistical Methods in Bioinformatics, I</td>
</tr>
</tbody>
</table>

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/)

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHP 2710</td>
<td>Interdisciplinary Perspectives on Disability and Death in the Global South 1</td>
</tr>
<tr>
<td>PHP 2730</td>
<td>Including the Excluded: Global Health Ethics 1</td>
</tr>
<tr>
<td>PHP 2507</td>
<td>Biostatistics and Applied Data Analysis I 1</td>
</tr>
<tr>
<td>PHP 2120</td>
<td>Introduction to Methods in Epidemiologic Research 1</td>
</tr>
<tr>
<td>PHP 2720</td>
<td>Implementing Public Health Programs and Interventions in the Global South 1</td>
</tr>
<tr>
<td>PHP 2740</td>
<td>Learning Global Health by Doing Global Health: Global Health Thesis Seminar 1</td>
</tr>
<tr>
<td>PHP 2508</td>
<td>Biostatistics and Data Analysis II 1</td>
</tr>
<tr>
<td>PHP 2750</td>
<td>Communicating and Disseminating Global Public Health Research 1</td>
</tr>
<tr>
<td>PHP 2760</td>
<td>Critical Perspectives in Global Health 1</td>
</tr>
</tbody>
</table>

Plus 3 electives 3

Total Credits 12
Courses

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. The current COVID-19 pandemic illustrates the vital role of public health in an increasingly interconnected world. This course will introduce students to fundamental topics in global health, and they will be encouraged to approach global health issues through a lens of equity and responsibility toward people and populations beyond United States’ borders. They 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.

Spr PHP0060 S01 26893 TTh 1:00-2:20(08) (N. Trivedi)

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. Seven discussion sections arranged during the semester. Open to undergraduates only.

Spr PHP0310 S01 25282 Arranged (I. Wilson)

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 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.

Fall PHP0650 S01 17978 TTh 10:30-11:50(13) (R. Aubert)

PHP 0850. Fundamentals of Epidemiology.
As the cornerstone of public health, a strong foundation in epidemiology provides students with the ability to investigate, clarify and criticize claims of disease causation. This course provides students with a foundation in basic epidemiologic concepts and methods. Key measures of disease occurrence and effects used in epidemiology will be discussed; strengths and weaknesses of alternative epidemiologic study designs will be examined. Interpreting epidemiologic evidence to inform public health policy and practice will be emphasized throughout the course. Open to Public Health concentrators and others by permission; Class limit 80.

Fall PHP0850 S01 15962 TTh 2:30-3:50(12) (S. Buka)
Fall PHP0850 C01 18108 Arranged (S. Buka)
Fall PHP0850 C02 18109 T 7:30-9:00PM (S. Buka)
Fall PHP0850 C03 18110 W 7:30-9:00PM (S. Buka)
Fall PHP0850 C04 18111 Th 7:30-9:00PM (S. Buka)
Fall PHP0850 C05 18445 Arranged (S. Buka)
Fall PHP0850 C06 18446 Arranged (S. Buka)
Fall PHP0850 C07 18447 Arranged (S. Buka)
Fall PHP0850 C08 18448 Arranged (S. Buka)
Fall PHP0850 C09 18449 Arranged (S. Buka)
Fall PHP0850 C10 18450 Arranged (S. Buka)
Fall PHP0850 C11 18451 T 7:30-9:00PM (S. Buka)
Fall PHP0850 C12 18452 W 7:30-9:00PM (S. Buka)

PHP 1010. Doctors and Patients- Clinical Communication in Medicine.
Communication is central to medical practice and interpersonal relationships between patients and physicians can be powerful curative agents. This course reviews theory and research on physician-patient communication. Lectures, readings, discussions and exercises are enhanced by direct observation in clinical settings. Appropriate for students interested in communication sciences, health psychology, health education, pre-med and other clinical training, and medical anthropology.

NOTE: Classes are on Mondays and Wednesdays 4-630 pm - two FRIDAY classes are scheduled at the beginning and end of the semester. Remaining class time fulfilled through clinical shadowing scheduled when students and doctors are available. Contact instructor for schedule.

PHP 1070. The Burden of Disease in Developing Countries.
Defines and critically examines environmental, epidemiologic, demographic, biomedical, and anthropological perspectives on health and disease in developing countries. Emphasis on changes in the underlying causes of morbidity and mortality during economic development. Focuses on the biosocial ecology of diseases. Required major term paper worth 50% of final grade is scholarly centerpiece of course. Weekly discussion sections and small group research projects supplement the two exams and term paper. Guest lecturers cover different diseases and public health experiences. Enrollment limited to 65.

Fall PHP1070 C01 16749 MW 8:30-9:50(01) (S. McGarvey)
Fall PHP1070 C02 17987 T 6:00-7:00 (S. McGarvey)
Fall PHP1070 C02 17980 M 6:00-7:00 (S. McGarvey)
Fall PHP1070 C03 17981 T 7:00-8:00PM (S. McGarvey)
Fall PHP1070 C04 17982 W 7:00-8:00PM (S. McGarvey)
Fall PHP1070 C05 18460 Arranged (S. McGarvey)

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. Questionnaire completion required for Freshman and Sophomore students. Enrollment limited to 30.

Fall PHP1100 S01 16765 MW 10:00-11:20(06) (O. Galarraga)
**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 1400. HIV/AIDS in Africa: A Multidisciplinary Approach to Support HIV/AIDS Care and Treatment Programs.**
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 1500. 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 PHP1500 | S01 16747 | TTh 1:00-2:20(08) | (R. Gutman) |
| Fall PHP1501 | L01 17044 | M 2:00-2:50 | (R. Gutman) |
| Fall PHP1501 | L02 17045 | W 1:00-1:50 | (R. Gutman) |
| Fall PHP1501 | L03 17046 | F 9:00-9:50 | (R. Gutman) |
| Fall PHP1501 | L04 17047 | F 10:00-10:50 | (R. Gutman) |

**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. Priority given to students concentrating in Public Health and Statistics. All others with instructor permission.

Fall PHP1510 | S01 18287 | TTh 9:00-10:20(02) | (S. Dunsiger) |

**PHP 1511. Applied Regression Analysis.**
This course provides a survey of regression techniques for outcomes common in public health data including continuous, binary, count and survival data. Emphasis is on developing a conceptual understanding of the application of these techniques to solving problems, rather than to the numerical details. Extensive use of the computer will be made for analysis of datasets.

Spr PHP1511 | S01 26478 | TTh 9:00-10:20(01) | (S. Dunsiger) |

**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 0101. Enrollment limited to 20 juniors, seniors, and graduate students.

**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 16766 | TTh 10:30-11:50(13) | (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 25285 | M 3:00-5:30 | (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.
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 16751 W 3:00-5:30 (S. Skeels)
Fall PHP1680I C01 17983 M 10:00-10:50 (S. Skeels)
Fall PHP1680I C02 17984 W 10:00-10:50 (S. Skeels)
Fall PHP1680I C03 17985 F 10:00-10:50 (S. Skeels)
Fall PHP1680I C04 18454 Arranged (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 transpires 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 25286 Th 4:00-6:30 (J. Nazareno)

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 why and how 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 18058 Th 4:00-6:30 (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.

Fall PHP1700 S01 16767 TTh 9:00-10:20(02) (K. Kelsey)

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 1802S. Human Security and Humanitarian Response: Increasing Effectiveness and Accountability. Disasters, natural and anthropogenic, pose significant threats to human security. Effective humanitarian action is important for both short and long-term responses to complex emergencies. The array of factors contributing to the economic and human losses experienced in both natural disasters and complex humanitarian emergencies are vast and complicated, and the strategies employed to mitigate and heal the damage caused by these disturbances must be equal to the task. This course covers diverse topics including the role of NGOs, UN agencies, local governments, peacekeepers and military in humanitarian response; economic impact of humanitarian aid; the evidence base for humanitarian interventions.

PHP 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 fate. 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. Students interested in taking the course must contact the professor directly for information about obtaining an override.

Spr PHP1820 S01 25287 MW 3:00-4:20 (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 25288 MW 9:00-10:20 '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 16759 W 3:00-5:30 (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 26479 Th 3:00-5:30 (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 16768 W 3:00-5:30 (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.
Fall PHP1895 S01 16752 W 3:00-5:30 (A. Field)

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 18013 M 9:00-11:30(06) (A. Field)

This dynamic course will provide an overarching public health capstone experience. Students will gain an in-depth knowledge by utilizing and strengthening oratory skills, written skills, and skills needed to work in teams. The instructor is formally trained in Internal Medicine, public health, health policy and clinical epidemiology, with experience which will be brought to the classroom. Topics will span public health successes, things that didn’t work, and things that need more work and effort. 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 PHP1910 S01 16752 W 3:00-5:30 (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 16769 M 3:00-5:30 (D. Grigsby)
Fall PHP1920 C01 18428 Arranged (D. Grigsby)
Fall PHP1920 C02 18429 Arranged (D. Grigsby)

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 17515 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.

This course surveys the entire landscape of the nutritional, biochemical, and genetic aspects of cardiometabolic health addressing issues of obesity, diabetes, metabolic syndrome, and their micro- and macro-vascular complications. Students will learn about both the descriptive and analytical epidemiology of these seemingly distinct but clearly clustered disorders including the so-called metabolic syndrome comprehensively and in-depth. International comparison of prevalent data in different social contexts will also be reviewed, so that strategies for prevention by either changing our cultures or natures can be appreciated and debated with a better understanding of the related issues confronted by public health and medical professionals.
Spr PHP2018 S01 26480 T 9:30-12:00 (S. Liu)

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 17513 TTh 2:30-3:50(12) (P. Vivier)
Fall PHP2023 C01 17514 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. Prerequisites: (PHP 2120 or PHP 2150) and either PHP 2508, 2510, or 2520. Open to graduate students only.
Fall PHP2030 S01 16753 M 1:00-3:30(06) (I. Gareen)

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 25291 Arranged (M. Clark)
Spr PHP2040 C01 26579 M 3:30-4:20 (M. Clark)
Spr PHP2040 C02 26580 M 4:20-5:10 (M. Clark)
Spr PHP2040 C03 26581 M 5:10-6:00 (M. Clark)
PHP 2060. Qualitative Methods in Health Research.
Introduces qualitative approaches to data collection and analysis in health research. Methods covered include: participant observation, key-informant interviews, focus groups, innovative data collection strategies, and non-obtrusive measures. Students will use applied projects to develop skills in: qualitative data collection and management, interviewing, transcript analysis using computerized software, triangulation between qualitative and quantitative data, and report preparation for qualitative studies. Enrollment limited to 20 graduate students.

Fall PHP2060  S01 16771  W  3:00-5:30  (E. Belanger)
Spr PHP2060  S01 25292  F  9:00-11:30  (R. Shield)

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

Spr PHP2071  S01 25293  T  1:00-2:20  (A. Wallack)

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

Fall PHP2072  S01 16754  T  1:00-2:20(08)  (A. Gjelsvik)
Fall PHP2072  C01 18047  Arranged  'To Be Arranged'
Fall PHP2072  C02 18048  Arranged  'To Be Arranged'
Fall PHP2072  C03 18049  M  5:40-7:00  'To Be Arranged'
Fall PHP2072  C04 18050  W  5:40-7:00  'To Be Arranged'

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.

Fall PHP2090  S01 16772  W  9:30-12:00(06)  (J. Braun)

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.

Fall PHP2120  S01 16773  TTh  10:30-11:50(13)  (M. Lurie)
Fall PHP2120  C01 18218  M  7:00-9:00PM  (M. Lurie)

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

Spr PHP2130  S01 25294  F  9:30-12:00  (K. Kelsey)

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. Prerequisite: PHP 2507 or 2510 (either may be taken concurrently); the typical student will also have some introductory knowledge of epidemiology.

Fall PHP2150  S01 16774  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.

Spr PHP2180  S01 25297  Th  2:30-5:00(10)  (D. Savitz)

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 2510 or 2507, or permission of the instructor. Co-require: PHP 2511 or 2508.

Spr PHP2200  S01 25561  TTh  10:30-11:50(09)  (N. Joyce)
Spr PHP2200  L01 25562  Th  12:00-1:00  (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 18034 W 9:30-12:00(06)  (S. Liu)

PHP 2220C. Perinatal Epidemiology: Women and Infants’ Health during Pregnancy in a Global Context.
This course introduces students to major topics that affect the health of women and their infants during pregnancy and the perinatal period. We will address issues relevant to both high and low-resource settings, but will pay particular attention to low-resource settings. The course covers pregnancy loss and pregnancy outcomes, chronic and infectious diseases during pregnancy, and key methodological issues when studying health outcomes during the perinatal period. The course will include course lectures, informal discussions with experts, and student-led discussions and journal clubs. Student will complete a course paper and brief presentation on a selected research topic. This course is open to masters and PHD students in any concentration or program who have taken an introductory epidemiology course such as PHP 2120 or PHP 2150, and, with instructor permission, to undergraduate students who have taken PHP 0850.

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.

Spr PHP2220E S01 26482 Th 9:30-12:00(09)  (J. Braun)

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 18112 Th 2:30-5:00(12)  (V. Danilack)

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).

Spr PHP2230 S01 25893 W 1:00-3:30(07)  (D. Operario)

PHP 2250. Advanced Quantitative Methods in Epidemiologic Research.
This course provides students with conceptual and quantitative tools based on counterfactual theory to make causal inference using data obtained from observational studies. Causal diagrams will be used to provide alternative definitions of and inform correcting for common biases. Non-, semi-, and fully parametric methods for addressing these biases will be discussed. These methods include standard regression, instrumental variables, propensity scores, inverse probability weighting, and marginal structural models. Settings when such methods may not be appropriate will be emphasized. Prerequisite: PHP 2200 and 2511; or PHP 2200 and 2508; or instructor permission. Enrollment limited to 25 graduate students.

Fall PHP2250 S01 16777 TTh 1:00-2:20(08)  (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 18036 Arranged (S. Rosenthal)
Fall PHP2260 C01 18186 Th 9:00-11:30 (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 16778 Th 4:00-6:30  (D. Operario)

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 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, prevention 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.

Spr PHP2330 S01 25893 W 1:00-3:30(07)  (D. Operario)
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 16779 T 12:00-2:30(06) (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 influence health-related behavior. Although we will, in some instances, discuss the effects of health-related behavior on affect and emotion, emotion and mood are NOT considered to be the outcome of interest.

PHP 2355. Designing and Evaluating Public Health Interventions.
Previously listed as PHP 1740. Examines health behavior decision-making and elements for design of health promotion interventions. Covers theories of health behavior (focusing on primary and secondary prevention), principles of intervention design, and reading of research literature. Emphasizes psychological, social, and proximate environmental influences on individuals' health-related behaviors. Restricted to undergraduates in the AB/MPh program, and graduate students. Prerequisite: PHP 0320 or equivalent. Enrollment limited to 35.
Fall PHP2355 S01 16780 MW 1:00-2:20(06) (P. Risica)
Spr PHP2355 S01 25300 MW 1:00-2:20(06) (T. Wray)

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.
Spr PHP2360 S01 25301 W 1:00-3:30(07) (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 16781 W 2:30-5:00(06) (K. Carey)

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.
Fall PHP2371 S01 16755 F 1:15-3:45(06) (P. Monti)

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.
Spr PHP2380 S01 25302 M 2:30-5:00(07) (K. Carey)

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.
Spr PHP2400 S01 25303 F 1:00-3:30(06) (C. Koller)
Spr PHP2400 C01 26860 Arranged (C. Koller)
Spr PHP2400 C02 26861 F 9:00-10:00 (C. Koller)
Spr PHP2400 C03 26862 T 4:00-5:00 ‘To Be Arranged’

PHP 2410E. Medicare: A Data Based Policy Examination.
This course will explore the role of Medicare as America’s health insurer for the elderly and disabled through the use of real Medicare insurance claims data, examining how Medicare policy changes in financing and regulation have affected the delivery and receipt of medical services. At the end of the course students will: 1) know the history of important Medicare policy changes; 2) be able to construct aggregated patient case mix acuity adjusted measures of provider quality using insurance claims data; 3) be able to conduct policy analyses using Medicare claims data that are sensitive to standardized coding schemes. Enrollment limited to 15 graduate students. Prerequisite: PHP 2120, 2508, or 2510. Instructor permission required.
Fall PHP2410E S01 16782 Th 12:00-2:30(06) (V. Mor)
PHP 2415. Introduction to Evidence-based Medicine. Unbiased assessments of the scientific literature by means of research synthesis methods are critical for formulating public health policy, counseling patients or prioritizing future research. We focus on the methods and use of systematic reviews and meta-analyses and their applications in medicine and health policy. After course completion, and with some direction, students will be able to undertake a basic systematic review or meta-analysis. Enrollment limited to 15. Prerequisites: PHP 2120, 2150, or 2460; and PHP 2507/08 or 2510/11 (2508 and 2511 may be taken concurrently); and clinical background or training in basic concepts in medicine (must discuss with instructor).

Spr PHP2415 S01 25304 W 9:00-11:30(03) (T. Trikalinos)

PHP 2436. Conflicting Priorities? Prescription Profits vs. the Public’s Health. The US spends more on pharmaceuticals than any other nation, reflecting higher use of medications and higher prices. US pharmaceutical firms are leaders in innovation and drug development. The purpose of this course is to provide an introduction to the study of the biopharmaceutical industry using an economic and policy analysis framework. This course is intended to broaden students’ understanding of the health policy process as it relates to pharmaceuticals. Students should have completed at least one year of biostatistics (PHP 2510 and PHP 2511) or equivalent coursework. Consent of the instructor may be sought as well.

PHP 2440. Introduction to Pharmacoepidemiology. The course will focus on substantive topics in pharmacoepidemiology, including relevant principles of pharmacology, inference from spontaneous case reports, study design considerations, premarketing pharmacoepidemiology, common data sources for pharmacoepidemiologic studies, drug utilization review, adherence, and the development, implementation, and assessment of therapeutic risk management policies. The course will also focus on issues in pharmacovigilance, including the legal and historical basis of pharmacovigilance, evaluation of individual adverse drug events, signal detection, active safety surveillance, and medication errors. A clinical background is not required. Prerequisites are PHP 2507, PHP 2508, PHP 2510, or PHP 2511, AND PHP 2120 or PHP 2150, or permission.

Spr PHP2440 S01 25305 Arranged (T. Shireman)

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 16758 M 3:00-5:30 (A. Trivedi)

PHP 2451. Exchange Scholar Program. Fall PHP2451 S01 15518 Arranged "To Be Arranged"
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.

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.

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.

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.

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

PHP 2524. 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.
PHP 2550. **Practical Data Analysis.**
Covers practical skills required for successful analysis of scientific data including statistical programming, data management, exploratory data analysis, simulation and model building and checking. Tools will be developed through a series of case studies based on different types of data requiring a variety of statistical methods. Modern regression techniques such as cross-validation, bootstrapping, splines and bias-variance tradeoff will be emphasized. Students should be familiar with statistical inference as well as regression analysis. The course will use the R programming language.

Fall PHP2550  S01  16787  MW  10:30-11:50(06)  (C. Schmid)
Fall PHP2550  C01  17991  M  6:00-7:30  'To Be Arranged'
Fall PHP2550  C02  17992  T  6:00-7:30  'To Be Arranged'
Fall PHP2550  C03  18135  Arranged  'To Be Arranged'

**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.

Fall PHP2560  S01  16788  TTh  9:00-10:20(02)  (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 biomedial or health challenge. This course will teach informatics and data science skills needed for public health and biomedicine research. Emphasis will be given to algorithms used within the context of biomedical research and health care, including those used in biomolecular sequence analysis, electronic health records, clinical decision support, and public health surveillance. This course has been developed as a Course-based Undergraduate Research Experience (CURE), where students will gain experience with the scientific method, its application, and presentation.

Fall PHP2560  S01  16788  TTh  9:00-10:20(02)  (A. Paul)

**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  25319  MW  10:30-11:50(03)  (C. Gatsonis)

**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  16789  T  1:00-3:30(06)  (L. Crawford)

**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 to using statistical software are emphasized. Prerequisites: PHP 2510 and 2511, or equivalent. Open to advanced undergraduates with permission from the instructor.

Fall PHP2602  S01  18016  TTh  2:30-3:50(12)  (J. Steingrimsson)

**PHP 2605. Generalized Linear Models.**
This course will focus on the theory and application of generalized linear models (GLM), a unified statistical framework for regression analyses. Specifically, we will focus on using GLMs to model the categorical outcomes. The GLM for categorical outcomes include logistic regression, proportional odds model, and Poisson regression. Maximum likelihood estimation and inference will be introduced in the GLM context. The students are expected to have knowledge of probability and inference (at the level of APMA1650, APMA1660, or PHP2520), knowledge of matrix algebra (at the level of MATH0520), knowledge of regression analysis (at the level of PHP2511) and knowledge of R.

Spr PHP2605  S01  25320  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  16790  TTh  9:00-10:20(02)  (J. Hogan)

**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 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  25321  TTh  9:00-10:20(01)  (Z. Wu)

**PHP 2650. Statistical Learning and Big Data.**
This course introduces modern statistical tools to analyze big data, including three interconnected components: computing tools, statistical machine learning, and scalable algorithms. It introduces the principal techniques: extract and organize data from complex sources, explore patterns, frame statistical problems, build computational algorithms, and disseminate reproducible research. Topics include web data extraction, database management, exploratory data analysis, dimension reduction, convex optimization algorithms, high-dimensional linear/nonlinear models, tree/ensemble methods, and predictive modeling. These techniques are illustrated using big data examples from many scientific disciplines. This course is open to graduate students and advanced undergraduate students pursuing degrees in science, technology, engineering, or mathematics. Students should have taken: either one course from: PHP 2510, PHP 2511, PHP 2550, APMA 2610; OR one course from: APMA 1690, APMA 1720, APMA 1930B, CSCI 0150, CSCI 0170; AND one course from: MATH 0520, MATH 0540. Students may ask permissions from the instructor for waiving this requirement. Students are also required to have some experience with any scripting language.

Spr PHP2650  S01  25322  TTh  10:30-11:50(09)  (A. Paul)

**PHP 2690A. Advanced Topics in Biostatistics.**
Introduction to applications of statistics and the way statisticians collaborate in interdisciplinary research. Guest lecturers from industry, government and academia will describe how statisticians fit into their environment. Techniques for effective collaboration and oral and written presentation of work including interviewing, writing proposals, giving talks, working with a team and consulting as an individual will be taught. Designed for graduate students (Masters or PhD) who would like to learn how to collaborate on projects with non-statisticians. Permission of the instructor is required to enroll for the course.

Fall PHP2690A S01  18689  Arranged  (Z. Wu)
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 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 16791 M 1:00-3:30(06)  (S. McGarvey)

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, adaptation, implementation, 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 public health programs.
Fall PHP2720 S01 18017 F 9:00-11:30(06)  (J. Pellowski)

PHP 2730. Including the Excluded: Global Health Ethics.
This course explores the ethics of global public health engagement. Global health implementation is fraught with ethical conundrums. These ethical conundrums include the process of generating rigorous evidence, championing health as a human right, engaging global partners in meaningful collaborations, and implementing complex programs in low-resource settings. These ethical challenges are driven by North-South inequities and by differences in socioeconomic backgrounds, culture, language, and other intersectional identities. This course introduces scholars to global health ethics as a framework for tackling health disparities, grappling in a scholarly and practical way with the complex fabric of global health research, policy, and practice.
Spr PHP2730 S01 26483 T 10:00-12:30(09)  (C. Kuo)

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 25324 M 2:30-5:00(07)  (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 17272 W 9:00-11:30(06)  (A. Harrison)

The purpose of this seminar is to facilitate discussions of current scientific literature in epidemiology, biostatistics, health services, 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 open to doctoral students in Epidemiology, Behavioral and Social Health Sciences, Biostatistics and Health Services Research.
Fall PHP2950 S01 16834 M 12:00-12:50(06)  (Z. Wu)
Fall PHP2950 S02 16836 F 12:00-12:50(06)  (C. Kahler)
Fall PHP2950 S03 16837 T 12:00-12:50(06)  (T. Zheng)
Fall PHP2950 S04 16838 M 12:00-12:50(15)  (I. Wilson)
Spr PHP2950 S01 25330 T 12:00-12:50  (T. Zheng)
Spr PHP2950 S02 25331 M 12:00-12:50(05)  (T. Trikalinos)
Spr PHP2950 S03 25332 F 12:00-12:50(06)  (A. Dulin)
Spr PHP2950 S04 25333 M 12:00-12:50  (Z. Wu)

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 2990. Thesis Preparation.
For graduate students who have met the residency requirement and are continuing research on a full time basis.
Fall PHP2990 S01 15519 Arranged To Be Arranged
Spr PHP2990 S01 24310 Arranged To Be Arranged

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

This document should contain certain fonts with restrictive licenses. For this draft, substitutions were made using less legally restrictive fonts. Specifically:

Helvetica was used instead of Arial.

The editor may contact Leepfrog for a draft with the correct fonts in place.