# PUBLIC HEALTH (PUBH)

## Explanation of Course Numbers

- Courses in the 1000s are primarily introductory undergraduate courses
- Those in the 2000s to 4000s are upper-level undergraduate courses that can also be taken for graduate credit with permission and additional work assigned
- Those in the 6000s and 8000s are for master's, doctoral, and professional-level students
- The 6000s are open to advanced undergraduate students with approval of the instructor and the dean or advising office

Graduate-level PUBH courses are organized by number ranges assigned to GWSPH departments, as follows:

- PUBH 6000–6099: MPH Core and MPH@GW Program-Specific
- PUBH 6100–6199: Environmental and Occupational Health
- PUBH 6200–6299: Epidemiology
- PUBH 6300–6399: Health Policy
- PUBH 6400–6499: Global Health
- PUBH 6500–6599: Prevention and Community Health
- PUBH 6600–6699: Exercise and Nutrition Sciences
- PUBH 6850–6899: Biostatistics and Bioinformatics
- PUBH 8000–8999: Doctoral-level

**PUBH 0920. Continuing Research - Master's. 1 Credit.**
Continuing Research Credit- Master's Level.

**PUBH 0940. Continuing Research - Doctoral. 1 Credit.**
Continuing Research Credit- Doctoral.

**PUBH 1010. First-Year Experience in Public Health. 1 Credit.**
Designed to assist students in the transition to GW and the School of Public Health by introducing skills and resources needed to succeed personally, academically, and professionally, particularly in a public health context. Restricted to Restricted to first-year School of Public Health students during their fall semester, PUBH 1010 is not required for internal or external transfer students.

**PUBH 1099. Variable Topics. 1-36 Credits.**

**PUBH 1101. Introduction to Public Health and Health Services. 3 Credits.**
Introduction to aspects of public health and health services, including health services administration and policy, maternal and child health, environmental health, and health promotion.

**PUBH 1102. History of Public Health. 3 Credits.**
Historical and philosophical development of public health and its contributions to understanding, preventing, and controlling disease and disabilities.

**PUBH 1102W. History of Public Health. 3 Credits.**
Social history of public health from the late nineteenth century to the present; historical context for contemporary public health problems. Includes a significant engagement in writing as a form critical inquiry and scholarly expression to satisfy the WID requirement. Prerequisite: UW 1020.

**PUBH 1142. Introduction to Health Data Science. 3 Credits.**
Introduction to health data science (HDS), including fundamentals of the ethical and safe capture, storage, manipulation, analysis, and presentation of data pertaining to the health of the individual and the public.

**PUBH 1242. Health Data Mining. 3 Credits.**
Introduction to data mining. Basic concepts, principles, methods, algorithms, and applications. Students should be comfortable with programming in at least one language and be knowledgeable about probability and regression. Prerequisites: CSCI 1012 or STAT 1129, or equivalent; and STAT 1051, or STAT 1053, or STAT 1111, or STAT 1127, or equivalent.

**PUBH 1299. Undergraduate Public Health Study Abroad. 1-6 Credits.**
May be repeated for credit when multiple courses with distinct subject matter are taken as part of a study abroad program.

**PUBH 2000. Navigating Internships with Strategies for Professional Development. 1 Credit.**
Preparatory class for students planning to obtain a public health internship. Equips students with the tools and knowledge to excel in the professional world. Topics include building resumes and cover letters, effective networking, and interviewing.

**PUBH 2110. Public Health Biology. 3 Credits.**
The biological causes of diseases of public health significance; basic scientific mechanisms, concepts, and principles in health and the pathogenesis of diseases. Provides a foundation for applications to public health. Prerequisites: One of the following: BISC 1005, 1006, 1007, 1008, 1111, 1112, or HONR 1033 in a biology topic.

**PUBH 2112. Principles of Health Education and Health Promotion. 3 Credits.**
Foundational understanding of the health education/health promotion field, using various resources to identify and explore theoretical and practical issues in the field. Prerequisites: PUBH 1101.

**PUBH 2113. Impact of Culture upon Health. 3 Credits.**
Relationships between cultural values and the development of modern health systems based on Western models of health care practice. Reliance upon traditional forms of health care. Examples of successful incorporation of traditional practices into evolving health care systems.

**PUBH 2114. Environment, Health, and Development. 3 Credits.**
Survey of the relationship between health and development and environmental trends. Topics include deforestation, urban contamination, and desertification.

**PUBH 2116. Global Delivery of Health Systems. 3 Credits.**
Introduction to health systems and the basic concepts of health systems administration and financing and health care reform with examples from advanced, middle income, and poor countries.

**PUBH 2117. Service Learning in Public Health. 3 Credits.**
A service-learning course that combines classroom instruction with practical learning. Students are responsible for securing an approved service site before the beginning of the semester; the instructor is available to assist with this placement.

**PUBH 2140. Foundations of Research Methods. 3 Credits.**
Builds an understanding of research methods, with an emphasis on qualitative research; the process of research, from thinking about a research question to data collection and presentation using common spreadsheet and presentation software.

**PUBH 2142. Introduction to Biostatistics for Public Health. 3 Credits.**
Applying biostatistical principles to analyze studies in health services literature. Selecting statistical methods based on research questions, calculating basic statistics for estimation and inference, interpreting results of statistical analyses.

**PUBH 2242. Natural Language Processing for Healthcare. 3 Credits.**
Provides an understanding of natural language processing, text mining methodologies, and their practical applications in healthcare. Prerequisites: PUBH 1142 or equivalent. Recommended background: Students should have a solid understanding of basic mathematical concepts, such as linear algebra and probability.

**PUBH 3000. Field Experience in Public Health. 0 Credits.**
Applied public health practice experience. Prerequisites: PUBH 1010 (may be waived for transfer students); PUBH 1011; and prior completion of at least two full-time semesters of study. Recommended background: PUBH 2000.

**PUBH 3115. Global Health and Human Rights. 3 Credits.**
Concepts of health as a human right and the impact of ethical violations on the mental and physical health of individuals; the efforts of the international community in addressing health consequences of vulnerable populations.

**PUBH 3116. Global Health Systems Performance. 3 Credits.**
Introduction to the U.S. and international health systems, both public and private, and the WHO Health Systems Framework; how environmental, ethical, cultural, and political actions shape health systems in different parts of the world. Restricted to juniors and seniors.

**PUBH 3130. Health Services Management and Economics. 3 Credits.**
Basics of management theory, finance, and economics as applied to managing in the public health and health services field. Restricted to sophomores, juniors, and seniors. Prerequisites: PUBH 1101; and ACCY 2001 or ECON 1011.

**PUBH 3131. Epidemiology. 3 Credits.**
Basic public health research designs and their relationship to establishing cause and effect. Determining effectiveness of interventions to prevent and cure disease at a population level. Prerequisites: PUBH 2142 is required for students in the BS in public health program; for all others, PUBH 2142 is preferred but APSC 3115, DNSC 1001, DNSC 2001, STAT 1051, STAT 1053, STAT 1111, or STAT 1127 are accepted.

**PUBH 3132. Health and Environment. 3 Credits.**
Introduction to environmental and occupational health and implications for individual and population health. Issues of clean water, environmental toxins, air pollution, and the environmental impact on infectious diseases. Restricted to Sophomores, Juniors, and Seniors.

**PUBH 3133. Global Health and Development. 3 Credits.**
Political, social, and economic determinants of health; measuring health status globally; burden of diseases that impact development; and epidemiological characteristics. Emphasis on low-income countries, health of the poor, inequity, and inequality. Restricted to juniors and seniors. Prerequisites: PUBH 1101.

**PUBH 3135W. Health Policy. 3 Credits.**
Introduction to the fundamentals of the healthcare system in the United States. Strategies available to policymakers when addressing problems related to access, financing, and delivery of healthcare. Restricted to Junior and Seniors. Prerequisites: PUBH 1101. Recommended background: PUBH 3130. Includes a significant engagement in writing as a form of critical inquiry and scholarly expression to satisfy the WID requirement.

**PUBH 3136. Health Law. 3 Credits.**
Legal concepts related to individual health care and public health systems in the United States. Health care law, public health law, and bioethics.

**PUBH 3137. Global Public Health Nutrition. 3 Credits.**
Consideration of hunger and other nutrition issues globally, including food insecurity, under/over nutrition, and micronutrient deficiencies. Application of UNICEF malnutrition framework to describe vulnerable groups, critique program strategies, and identify multisectorial strategies to reduce hunger and malnutrition. Prerequisite: PUBH 3133.

**PUBH 3150. Sustainable Energy and Environmental Health. 3 Credits.**
Sustainability issues from the perspective of environmental health. Technical, social, and health implications of specific energy sources. Energy conservation and efficiency in the context of population growth, food and water resources, and maintenance of a healthy environment for future generations.

**PUBH 3151. Current Issues in Bioethics. 3 Credits.**
General and specific ethical questions and ethical decision making from both personal and organizational perspectives; right to health care, research with human subjects, reproductive technology, genetics, professional and student roles and responsibilities, and end-of-life issues.

**PUBH 3151W. Current Issues in Bioethics. 3 Credits.**
General and specific ethical questions and ethical decision making from both personal and organizational perspectives; right to health care, research with human subjects, reproductive technology, genetics, professional and student roles and responsibilities, and end-of-life issues. Includes a significant engagement in writing as a form of critical inquiry and scholarly expression to satisfy the WID requirement.

**PUBH 3199. Topics in Public Health. 1-5 Credits.**
Topics vary by semester. See the Schedule of Classes for more details. May be repeated for credit provided the topic differs.

**PUBH 3201. Introduction to Bioinformatics. 3 Credits.**
Introduction to bioinformatics: biological concepts of molecular biology, genome organization, and evolution; computational concepts of alignment, database searching, phylogeny, and structural bioinformatics; programming concepts in Unix and Python. Credit cannot be earned for this course and BISC 2584, CSCI 3571.

**PUBH 3202. Introduction to Genomics. 3 Credits.**
Principles of genomics; genome projects, including the human genome, molecular techniques, analytical approaches, computational tools for genome research, and genomic data generation and analysis. Prerequisites: BISC 1111 or BISC 1112.

**PUBH 3232. Health Data Mining. 3 Credits.**
Basic concepts, principles, methods, algorithms, and applications of data mining. Using R to apply core data mining topics (regression, classification, clustering, and prediction) to analyze public health data. Prerequisites: CSCI 1012, PUBH 4201, or STAT 1129, or an equivalent course in at least one programming language; and STAT 1051, STAT 1053, STAT 1111, or STAT 1127, or an equivalent course in probability and regression.

**PUBH 3242. Health Data Visualization. 3 Credits.**
Introduction to health data visualization techniques and approaches to illustrate data for pattern discovery and storytelling in various scientific fields such as health and biomedical. Prerequisites: PUBH 1142. Recommended background: Basic R programming.

**PUBH 3299. Undergraduate Public Health Study Abroad. 1-6 Credits.**
May be repeated for credit when multiple courses with distinct subject matter are taken as part of a study abroad program.

**PUBH 3995. Undergraduate Research in Public Health. 9 Credits.**
Students work under a faculty mentor to acquire the knowledge and skills central to the design, conduct, and analysis of scientific research. A proposal must be preapproved by the BS in public health program director and the dean's office.

**PUBH 4140W. Senior Seminar. 3 Credits.**
Students develop a public health intervention incorporating various domains of the discipline of public health. Restricted to Seniors in the BS in public health program. Prerequisites: PUBH 2112, PUBH 2140, PUBH 3130, PUBH 3131, and PUBH 3135W. Recommended background: PUBH 2110, PUBH 3132, and PUBH 3133. Includes a significant engagement in writing as a form of critical inquiry and scholarly expression to satisfy the WID requirement.

**PUBH 4199. Independent Study. 1-6 Credits.**
An outline of the intended project must be approved by the instructor and the dean's office prior to enrollment. Restricted to public health majors.

**PUBH 4201. Practical Computing. 3 Credits.**
Basic concepts of computer programming in biomedical sciences and health informatics; foundations of R and Python languages; best programming practices in health applications. Prerequisites: BISC 1111 or BISC 1112.

**PUBH 4202. Bioinformatics Algorithms and Data Structures. 3 Credits.**
Algorithmic foundations of bioinformatics, ranging from generic algorithmic techniques to specific algorithms used in various areas of bioinformatics. Prerequisite: PUBH 4201.

**PUBH 6000. MPH Applied Practice Experience. 0 Credits.**
Provides students with an opportunity to synthesize, integrate, and apply practical skills, knowledge, and training learned in their MPH courses by gaining practical experience in a public health work environment. Restricted to students in the MPH program.

**PUBH 6002. Biostatistical Applications for Public Health. 3 Credits.**
Application of biostatistical principles to critical analysis of retrospective studies, prospective studies, and controlled clinical trials, as well as studies in the health services literature. Selection, basic calculations, and interpretation of statistical methods for detection of significant associations and differences.

**PUBH 6003. Principles and Practices of Epidemiology. 3 Credits.**
General principles, methods, and applications of epidemiology. Outbreak investigations, measures of disease frequency, standardization of disease rates, study design, measures of association, hypothesis testing, bias, effect modification, causal inference, disease screening, and surveillance. Case studies apply these concepts to a variety of infectious, acute, and chronic health conditions affecting the population.

**PUBH 6007. Social and Behavioral Approaches to Public Health. 2 Credits.**
Social and behavioral science theories, models, and concepts that can be applied to public health problems and interventions. The role of social and community factors, including race, ethnicity, and culture, in both the onset and solution of public health problems; the interrelationship between the social and behavioral sciences.

**PUBH 6009. Fundamentals of Public Health Program Evaluation. 2 Credits.**
Topics include designing program evaluation studies to produce and interpret evidence to improve public health; options for evaluation study design and evidence generation; and qualitative data collection and analysis methods. Prerequisites: PUBH 6007. Recommended background: Prior completion of PUBH 6002.

**PUBH 6010. Independent Study. 1-6 Credits.**
Designed to provide the student with an opportunity to gain or enhance public health knowledge and to explore an area of interest related to public health research or the delivery and/or administration of health services. Permission of the instructor or advisor required prior to enrollment.

**PUBH 6011. Environmental and Biological Foundations of Public Health. 3 Credits.**
The connection between population health and exposures to chemical, physical, and biological agents in the environment; interconnection between dimensions of environmental systems and all living things; biological sciences as they relate to environmental impacts.

**PUBH 6012. Fundamentals of Health Policy. 2 Credits.**
Comparative study of the structure, financing, and delivery of public health and health care in the United States and abroad; core elements of policy analysis are used to develop skills in analyzing a public health problem and presenting possible solutions both orally and in writing.

**PUBH 6013. Master's Thesis. 3 Credits.**
See Advisor.

**PUBH 6014. Practicum. 1-3 Credits.**
This course provides the opportunity for MPH students to apply the knowledge and skills acquired through their programs of study. A planned, supervised and evaluated practice experience that is relevant to the student's program is an essential component of a public health professional degree program. These opportunities can take place in a variety of agencies or organizations. Each program customizes Practicum requirements to meet students' needs. (Credit/No Credit) [For 45-credit MPH students who started Summer 06 or after.].

**PUBH 6015. Culminating Experience. 1-3 Credits.**
Synthesize and integrate knowledge and apply theory and principles to a situation that approximates professional practice. Demonstrate mastery of the body of knowledge and proficiency in the required competencies. Prerequisites: PUBH 6002, PUBH 6003, PUBH 6007, PUBH 6012, and PUBH 6500.

**PUBH 6016. Field/Laboratory Experience. 2 Credits.**
The overall purpose of the field/laboratory experience requirement is to introduce students in the MS-PHMEID degree program to a supervised practical experience in a Public Health Laboratory or other qualifying public health entity from the perspective of the actual wet laboratory operations. Students that already have this laboratory experience are introduced to epidemiologic research, particularly surveillance, and its tie-in with laboratories either in the United States or in an international setting.

**PUBH 6021. Essentials of Public Health Practice and Leadership I. 1 Credit.**
The skills necessary for being an effective practitioner and leader; optimizing self-management and contributions in teams as public health professionals.

**PUBH 6022. Essentials of Public Health Practice and Leadership II. 1 Credit.**
The development of organizations and systems in public health; organizational management tools and collaborative, outcome-oriented advocacy techniques. PUBH 6021 may be taken as a corequisite. Prerequisite: PUBH 6021.

**PUBH 6023. Interprofessional Education Experience. 0 Credits.**
Completion of an interprofessional education experience (IPE) is required for all MPH students. Maximizes the student's capacity for collaboration with others to better address public health and health care challenges. A variety of options are available for students to complete this requirement before graduation. Restricted to MPH students. Prerequisites: PUBH 6002, PUBH 6003, PUBH 6007, PUBH 6011, PUBH 6012, and PUBH 6021.

**PUBH 6045. National and Global Public Health Systems. 1 Credit.**
Frameworks for national and global public health systems, and how lessons learned from the COVID-19 pandemic can help such systems be better prepared to address the broad range of public health challenges facing populations.

**PUBH 6047. Systematic Reviews to Synthesize Evidence in Public Health Practice. 1 Credit.**
Overview of the design, implementation, and interpretation of systematic reviews and meta-analyses based on case studies of contemporary health controversies in public health. Prerequisites: PUBH 6002 and PUBH 6003. Recommended background: Prior completion of coursework on study design, such as PUBH 6410 and/or PUBH 6247, is strongly encouraged.

**PUBH 6050. Introduction to Health Services Delivery. 2 Credits.**
Introduction to the systems that define and shape delivery of health services in the United States. Case studies and presentations on major issues develop an appreciation of dilemmas confronting policymakers, providers, and patients: balancing cost, quality and access. Access and disparity, health care professions, facilities, managed care organizations and government health care programs. Policy changes that have had major impact on American health care in the past century. Fall.

**PUBH 6052. Practical Data Management and Analysis for Public Health. 2 Credits.**
Practical aspects of dataset creation, data management, rudimentary statistical analysis, and tabular and graphical presentation of results. Creating codebooks, entering and cleaning data, deriving new variables from existing ones, choosing and implementing appropriate analytical techniques, graphing and tabulating results, and documenting and protecting work. Prerequisites: PUBH 6002 and PUBH 6003.

**PUBH 6054. Community Engagement and Advocacy. 2 Credits.**
Tools and strategies for public health practitioners to understand, respect, organize, and collaborate with community groups and organizations for promotion of healthy behaviors. Development of practical skills to harness available resources in a community to advocate for healthy living and positive health outcomes.

**PUBH 6056. Public Health Leadership Seminar. 1 Credit.**
Leadership lessons taken from the careers of a diverse group of executives and entrepreneurs from the corporate, government, nonprofit, and art sectors. Leadership theory and styles. Building networks; skills for effectively engaging with peers, potential employers, and business partners.

**PUBH 6058. Researching Violence Against Women and Girls. 2 Credits.**
The intersection of violence against women and girls (VAWG) and public health; the impact that violence has on the health of the survivor, her current and future children, and communities; methods and best practices for designing applied research on VAWG. Prerequisites: PUBH 6002, PUBH 6003, PUBH 6007, PUBH 6011 and PUBH 6012.

**PUBH 6060. MPH@GW Culminating Experience I. 1 Credit.**
Demonstrate knowledge and skills learned through MPH coursework and practical experiences by applying the principles and methods of public health practice to a public health issue. Restricted to students in the MPH@GW program. Prerequisites: PUBH 6002, PUBH 6003, and PUBH 6007; and PUBH 6004 or PUBH 6011; and PUBH 6006 or PUBH 6012; and PUBH 6009 or PUBH 6437.

**PUBH 6061. MPH@GW Culminating Experience II. 1 Credit.**
Demonstrate knowledge and skills learned through MPH coursework and practical experiences by applying the principles and methods of public health practice to a public health issue. Restricted to students in the MPH@GW program. Prerequisites: PUBH 6060.

**PUBH 6080. Pathways to Public Health. 0 Credits.**
Introduces the 12 foundational public health learning objectives to GWSPH students in non-MPH graduate programs. Must be completed before the last day of classes in the student's first semester of matriculation.

**PUBH 6090. Practicum/Culminating Experience. 4 Credits.**
Individually tailored. Culminating Experience for the MPH program. Permission of the advisor required prior to enrollment.

**PUBH 6091. Special Project. 1-4 Credits.**
Under faculty supervision, the student undertakes an original project that applies the skills and knowledge gained in the chosen track and/or concentration within the MPH program. Prerequisite: Permission of the instructor. NOTE that credits vary by program; please consult your program plan to register for the appropriate number of credits. [For 36-credit MPH students only].

**PUBH 6099. Topics in Public Health. 3 Credits.**
In-depth examination of a particular facet of public health. Topics vary by semester. See the Schedule of Classes for more details. May be repeated for credit provided the topic differs.

**PUBH 6121. Environmental and Occupational Epidemiology. 3 Credits.**
Demonstration and application of epidemiologic methods for the study of environmental and occupational health problems; epidemiologic exposure assessment methods and methods relevant to cohort, case-control, cross-sectional, and case cross-over studies; survey design and sources and evaluation of biases and confounding; emphasis on written and oral communication skills. Prerequisites: PUBH 6002 and PUBH 6003; and PUBH 6004 or PUBH 6011.

**PUBH 6122. Protecting Public Health and the Environment: Policies, Politics, and Programs. 3 Credits.**
The legislative, regulatory, judicial, and political system in the United States developed to protect human health and the environment. National and global public and environmental health agencies, policy development, and current topics. Prerequisites: PUBH 6004 or PUBH 6011.

**PUBH 6123. Toxicology: Applications for Public Health Policy. 3 Credits.**
Toxicology as both a scientific discipline and a source of information for public health policy with respect to the regulation of foods, pesticides, drugs (pharmaceuticals), environmental chemical pollutants, and other chemicals that may affect human and environmental health. How chemicals interact with biological systems to produce adverse effects. The ways in which toxicologic information is developed and applied to regulatory decision making and the use of toxicology in regulatory risk assessment. Prerequisites: PUBH 6004 or PUBH 6011.

**PUBH 6124. Risk Management and Communication. 3 Credits.**
Culminating course using problem-based learning methods to examine a variety of real-world environmental and occupational health issues in-depth. Students integrate cumulative knowledge across all required courses and demonstrate professional competencies. Prerequisites: PUBH 6121, PUBH 6123 and PUBH 6126.

**PUBH 6126. Assessment and Control of Environmental Hazards. 3 Credits.**
Introduces the anticipation, recognition, assessment, and control of hazards in the workplace and the ambient environment. It emphasizes an understanding of the characteristic features of specific hazards, which may be chemical, biological, or physical/ergonomic.

**PUBH 6127. Introduction to Environmental Health Microbiology. 2 Credits.**
Basics of public health microbiology as it relates to the environment, food, water, and bioterrorism. Examines from an environmental health perspective how the principles of microbiology are applied to current and emerging public health issues, whether from intentional or unintentional contamination of the environment. Prerequisites: PUBH 6004 or PUBH 6011.

**PUBH 6128. Global Environmental and Occupational Health. 2 Credits.**
Examination of the global environmental and occupational health factors that contribute significantly to the global burden of disease, focusing primarily on low- and middle-income countries; principles from behavioral sciences, development economics, risk assessment, and epidemiology are included; potential solutions to environmental health problems, metrics used to measure impacts, and areas for future research. Prerequisites: PUBH 6004 or PUBH 6011.

**PUBH 6130. Sustainable Energy and the Environment. 2 Credits.**
Sustainability of energy strategies, including conservation, green building, renewables, and mitigation/adaption for climate change. Emphasis on the life cycle framework. Includes natural resource depletion, energy consumption, and waste emissions. Prerequisites: PUBH 6004 or PUBH 6011.

**PUBH 6131. Quantitative Methods in Environmental and Occupational Health. 3 Credits.**
Application of biostatistical and epidemiologic concepts and methods to analysis of EOH data. Development and practice of skills needed for analyzing complex exposures and communicating environmental and occupational research findings. Prerequisites: PUBH 6002 and PUBH 6003; and PUBH 6004 or PUBH 6011.

**PUBH 6132. Water, Sanitation, and Hygiene (WASH) in Low-Income Countries. 2 Credits.**
Introduction to working in both disaster and development settings in countries where contaminated water, inadequate sanitation, and poor hygiene (WASH) cause serious health problems. Students gain practical experience applying WASH methods in the field. Prerequisites: PUBH 6004 or PUBH 6011.

**PUBH 6133. Social Dimensions in Climate Change and Health. 3 Credits.**
The drivers of climate change and outcomes with particular focus on health dimensions; obstacles, vulnerabilities, inequality, and adaptation as well as technical and social solutions.

**PUBH 6135. Researching Climate Change and Human Health. 3 Credits.**
The ways in which climate affects public health and how research in this topic applies to communities. Critical evaluation of climate change and human health research. Recommended background: Prior completion of PUBH 6011 or PUBH 6003.

**PUBH 6136. Introduction to Environmental and Occupational Epidemiology. 3 Credits.**
Epidemiologic research designs; methods for the study of environmental and occupational health problems; exposure assessment methods; design aspects of cross-sectional, case-control, cohort, and case cross-over studies; sources and evaluation of biases and confounding; survey and questionnaire design. Prerequisites: PUBH 6002, PUBH 6003 and PUBH 6011.

**PUBH 6137. Environmental and Occupational Health Culminating Experience I. 1 Credit.**
The first in a two-course sequence. The final, integrative learning experience for the MPH in environmental health science and policy or global environmental health. Students apply the skills and knowledge, theories, and principles learned in the MPH program to practical public health problems. Restricted to MPH students in the Department of Environmental and Occupational Health who have completed all core courses and at least 9 credits in program-specific courses. Prerequisites: PUBH 6002 and PUBH 6003; PUBH 6004 or PUBH 6011; PUBH 6006 or PUBH 6012; and PUBH 6007.

**PUBH 6138. Environmental and Occupational Health Culminating Experience II. 1 Credit.**
The second in a two-course sequence. The final, integrative learning experience for the MPH in environmental health science and policy or global environmental health. Students apply the skills and knowledge, theories, and principles learned in the MPH program to practical public health problems. Restricted to MPH students in the Department of Environmental and Occupational Health. Prerequisite: PUBH 6137.

**PUBH 6140. Global Climate Change and Air Pollution. 2 Credits.**
The state of the air in the Anthropocene epoch. Key concepts of atmospheric science, public health, and other societal impacts. Local and global policy frameworks. Prerequisites: PUBH 6004 or PUBH 6011.

**PUBH 6141. Systemic Change for a Sustainable and Healthy Planet. 3 Credits.**
How the major health hazards caused by global climate change and environmental degradation can be addressed through system change approaches, including through governance, health systems, corporations, and other institutions. Prerequisites: PUBH 6011.

**PUBH 6144. Environmental Health Data Development and Modeling. 2 Credits.**
Introduction to sources of environmental data, handling and cleaning of data, and using data in both statistical and environmental exposure models. Prerequisites: PUBH 6131 or PUBH 6853.

**PUBH 6146. Microbiomes and Microbial Ecology in Public Health. 2 Credits.**
Introduction to key concepts of environmental microbial ecology and the human microbiome. The roles of microbes in ecosystems' functions with a focus on climate change and the roles of microbes in human health and disease. Prerequisites: PUBH 6011.

**PUBH 6199. Topics in Environmental and Occupational Health. 3 Credits.**
Topics vary by semester. May be repeated for credit provided topics differ. Consult the Schedule of Classes for more details.

**PUBH 6220. Challenges and Controversies in Brain Health and Dementia Studies. 1 Credit.**
Provides an overview of the basic epidemiology and biology of dementia and introduces current topics, challenges, and controversies in the area of brain health and dementia research.

**PUBH 6230. Epidemiology of Psychiatric Disorders. 2 Credits.**
The ways in which epidemiologic methods are used to assess psychiatric disorders and symptoms in general populations. Prerequisites: PUBH 3131 or PUBH 6003.

**PUBH 6231. Epidemiology of Drug and Vaccine Safety. 1 Credit.**
Introductory course on the importance of, and challenges and opportunities related to, studying the epidemiology of drug and vaccine safety in the real world. Prerequisites: PUBH 6002 and PUBH 6003.

**PUBH 6232. The Autism Experience from a Public Health Perspective. 2 Credits.**
The science, varying viewpoints, and experience of autism through community participatory methods. Focus on autistic young adults transitioning to adulthood.

**PUBH 6233. Epidemiologic Principles and Practice of Disease Eradication. 2 Credits.**
The role of epidemiology, surveillance, research, and information technology in the eradication of vaccine preventable and parasitic human diseases. Prerequisites: PUBH 6003.

**PUBH 6234. Epidemiologic Methods in Neglected Tropical Disease Control. 1 Credit.**
Introduction to neglected tropical disease epidemiology providing a broad overview of select tropical medicine and public health issues; focus on applications of epidemiologic methods to the study of public health consequences of NTDs. Prerequisites: PUBH 6003. Corequisites: PUBH 6011.

**PUBH 6235. Epidemiology of Obesity. 1 Credit.**
Introduction to the epidemiology of obesity; descriptive epidemiology, measurement, consequences, and determinants of obesity; adiposity and body composition; obesity interventions and policy. Prerequisites: PUBH 6003.

**PUBH 6237. Chronic Disease Epidemiology. 2 Credits.**
Overview of the epidemiology (descriptive, analytic, and etiologic) of chronic diseases. Emphasis on epidemiologic methods and study design in relation to chronic disease, as well as public health approaches to disease control including surveillance, screening, and interventions. Prerequisites: EXNS 6204 or PUBH 6002; and EXNS 6208 or PUBH 6003.

**PUBH 6238. Molecular Epidemiology. 1 Credit.**
Concepts, principles, and use of molecular methods in epidemiologic and clinical research. Common molecular measures and their interaction with environmental factors. Development of a framework for interpreting, assessing, and incorporating molecular measures in their area of research. Prerequisites: PUBH 6003.

**PUBH 6239. Epidemiology of Foodborne and Waterborne Diseases. 1 Credit.**
Foodborne and waterborne toxicants; diseases linked to eating and drinking and their prevention. Topics include transmission of disease and disease processes; microbial toxins, mycotoxins, chemical toxins, bacterial infections (e.g., salmonellosis, shigellosis, vibrio, listeria), virus and parasitic infections; issues in food and water safety. Prerequisites: PUBH 6003.

**PUBH 6240. Pediatric HIV/AIDS. 1 Credit.**
Comprehensive overview of HIV infection in children, with emphasis on the global pediatric HIV epidemic. Biological, epidemiological, clinical, and psychosocial issues; public health programmatic approaches to prevention, care, and treatment. The national and global experience with scaling up prevention services in the global effort to virtually eliminate HIV/AIDS in children. Prerequisites: PUBH 6003. Recommended background: PUBH 6250 and PUBH 6253.

**PUBH 6241. Nutritional Epidemiology. 2 Credits.**
Methodological issues related to dietary assessment, nutrition surveillance, and the epidemiology of obesity. Current trends, including the health impacts of vitamin D and sodium. Interpretation of the scientific literature in the field. Examples drawn from the National Health and Nutrition Examination Survey. Prerequisites: PUBH 6003.

**PUBH 6242. Clinical Epidemiology and Public Health: Reading the Research. 2 Credits.**
Methods for reading epidemiology and public health research including case-control, cohort studies, randomized controlled trials, meta-analysis, testing and screening, prediction rules, decision and cost-effectiveness analysis. Prerequisites: PUBH 6003 or equivalent.

**PUBH 6243. Topics in Clinical Epidemiology and Public Health: Reading the Research. 1 Credit.**
An evidence-based problem solving applications course utilizing methods taught in PubH 6242 Clinical Epidemiology and Public Health: Reading the Research Prerequisites: PUBH 6003. Credit cannot be earned for this course and PUBH 8242.

**PUBH 6244. Cancer Epidemiology. 2 Credits.**
Epidemiology of specific cancers, with an emphasis on molecular and genetic epidemiology. Current research in the field. Prerequisites: PUBH 6003.

**PUBH 6245. Infectious Disease Epidemiology. 2 Credits.**
The role and conduct of laboratory and field investigations in the epidemiology of infectious diseases. Prerequisite: PUBH 6003.

**PUBH 6247. Epidemiologic Methods I: Design of Health Studies. 3 Credits.**
Study design, proposal development, and critique of published studies. Prerequisites: PUBH 6003. Corequisites: PUBH 6002.

**PUBH 6248. Epidemiology of Dementia and Adult Cognitive Health. 2 Credits.**
The demographics of aging; biology of the central nervous system; measurement of cognition and brain health for research; and epidemiology of dementia and related diseases/disorders of cognition in older adults. Prerequisites: PUBH 6003.

**PUBH 6250. Epidemiology of HIV/AIDS. 2 Credits.**
Methodological issues central to HIV/AIDS research. Biases peculiar to HIV/AIDS epidemiologic studies (both observational and experimental designs). The natural history of HIV, diagnosis, surveillance, vulnerable subpopulations, behavioral facets, and evaluation of epidemiologic studies with an emphasis on methodological considerations. Prerequisites: PUBH 6003. Recommended background: PUBH 6002.

**PUBH 6251. HIV Prevention Epidemiology and Methods. 2 Credits.**
The epidemiology of HIV prevention with a focus on methodological issues central to HIV prevention research. Prerequisites: PUBH 6003. Recommended background: prior completion of PUBH 6002.

**PUBH 6252. Epidemiologic Methods II: Advanced Epidemiologic Methods. 3 Credits.**
Continuation of PUBH 6247. Advanced epidemiologic methods after data collection. Quantification of common epidemiologic results, biases, interpretation of analysis, drafting of analysis plans, and journal results sections. Prerequisites: PUBH 6247; and PUBH 6853 or PUBH 6249.

**PUBH 6253. Issues in HIV Care and Treatment. 1 Credit.**
This course provides an overview and in depth consideration of some of the major issues in treatment of HIV disease, including the assessment of efficacy and effectiveness, drug resistance, monitoring of drug toxicity, special populations, the interrelationship between treatment and prevention, and quality of care. The course has been designed with an interdisciplinary audience in mind. In discussions and assignments, students are able to emphasize their own area of interest and/or expertise (e.g. epidemiology, policy, etc).

**PUBH 6254. Epidemiology of LGBTQIA Health. 1 Credit.**
Foundation for using epidemiologic research to guide actions and policies supporting the health of lesbian, gay, bisexual, transgender, queer, intersex, and asexual (LGBTQIA) people. Prerequisites: PUBH 3131 or PUBH 6003.

**PUBH 6255. Organizational Responses to the Local, National, and Global HIV/AIDS Epidemics. 2 Credits.**
This seminar focuses on the rapidly evolving responses of local, national and global governmental and non-governmental organizations to the HIV/AIDS epidemic. Inspirational leaders of selected HIV/AIDS organizations are invited to describe how their organizations contribute to fighting the epidemic; the leadership and management skills that they use in their daily work; and their strategic decision-making processes. Basic principles of epidemiology, leadership and organizational strategy and structure are addressed through didactic presentations and interactive faculty-student dialogue. Lessons learned through the lens of HIV/AIDS organizations are broadly applicable to other public health problems. Students learn about the strengths and challenges of different types of public health organizations as they make career decisions about their own transition to the public health work force. Prerequisites: PUBH 6003, HIV/AIDS experience, or permission of the instructor.

**PUBH 6259. Epidemiology Surveillance in Public Health. 2 Credits.**
Focus on foundations of public health surveillance systems for communicable as well as chronic diseases. Outbreak investigation methods are included, as well as surveillance data sources, data management, data analysis, ethical issues, surveillance system evaluation, and use of information for prevention. Surveillance systems for reportable diseases, nosocomial infections, bioterrorism events, cancer, environmental disease, vaccine-related adverse events, bovine spongiform encephalopathy, and military personnel are discussed. Prerequisites: PUBH 6003.

**PUBH 6260. Applied Epidemiologic Data Analysis. 3 Credits.**
Training in data analytical tools as they relate to public health issues. Regression model fitting, assessing interactions, longitudinal data analysis, ordinal data analysis, survival analysis, and Poisson regression. Prerequisites: PUBH 6002; and 6249 or PUBH 6853; or equivalent as determined by the instructor.

**PUBH 6262. Introduction to Geographic Information Systems. 1 Credit.**
Geographic information systems (GIS) for mapping and display of health data. The course makes use of ArcGIS 8.3. The use of spatial statistics for the detection of clusters and patterns in the spread of diseases. Working with geodatabases, shape files, layers, query information from attribute tables, geocode addresses and customizing GIS applications.

**PUBH 6263. Advanced GIS. 1 Credit.**
Provides mid to advanced level training in GIS for display and analysis of health data. Use software ArcGIS 9.3 and additional extensions such as Spatial Analyst and Geostatistical Analyst. Also uses GeoDa software. Emphasizes benefits of using GIS to do more than simply manage and map data. GIS supports a range of spatial analysis functions that enable researchers to extract additional meaning from manipulating geographic data. Learn to work with raster datasets and geodatabases to build spatial models for analyzing health data and evaluating spatial patterns of health events based on notion of distance. Prerequisites: PUBH 6262.

**PUBH 6265. Design of Medical Studies. 3 Credits.**
Design of medical investigations, including the randomized clinical trial, observational cohort study, and the retrospective case-control study. Specific methods regarding sample size, power and precision and statistical procedures for randomization and sa.

**PUBH 6266. Biostatistical Methods. 3 Credits.**
Biostatistical methods for asymptotically efficient tests and estimates of relative risks and odds ratios from prospective and retrospective matched and unmatched studies. Fixed and random effects models. Logistic regression, conditional logistic regression. Poisson regression. Maximum likelihood and efficient scores. Prerequisites: STAT 6201, STAT 6202 and PUBH 6264.

**PUBH 6267. Time Series Applications in Public Health. 2 Credits.**
Introduce basic concepts for the identification and modeling of time series in the time domain approach. Learn a new set of terminology standards and a different way to analyze these type of data and to forecast future values of a time series and its accuracy. Software used is SAS/ETS and 3 procedures: ARIMA, AUTOREG, FORECAST. New mathematical notation is used. Prerequisites: PUBH 6249.

**PUBH 6269. Reproductive Epidemiology. 1 Credit.**
Current research, controversial issues, and methodological problems in the epidemiology of reproductive health, including conception, infertility, contraception, abortion, reproductive senescence and dysfunction, and reproductive cancers. Prerequisites: PUBH 6003.

**PUBH 6270. HIV/AIDS Surveillance. 1 Credit.**
Overview of surveillance methods used domestically and internationally to monitor HIV/AIDS epidemic. Surveillance systems including sentinel, population based, behavioral, and incidence surveillance are presented and discussed. Strengths and weaknesses of these various systems are discussed in addition to how data from these systems impact and inform HIV/AIDS related policies and programs. Prerequisites: PUBH 6003.

**PUBH 6271. Disaster Epidemiology. 1 Credit.**
Introduction to disaster epidemiology that elucidates the important role epidemiologists play in assessing the health and psychological effects of natural and man-made disasters and in identifying factors that contribute to these effects. Focus on applications of epidemiologic methods to the study of public health consequences of disasters, case studies from actual disasters used to illustrate various roles of epidemiologist in responding to these events and lessons learned. Highlight key skills that epidemiologists need to be part of a response and recovery. Identify methodological issues for future work. Prerequisites: PUBH 6002 and PUBH 6003.

**PUBH 6272. Epidemiology of Infectious Agents Associated with Human Cancer. 1 Credit.**
Describes the role of infectious agents in the etiology of human cancer. Emphasis on differences between specific oncogenic viruses. Other oncogenic agents, bacterial and parasitic, are also discussed. Discuss laboratory approaches to the documentation of their pathogenicity, how behavior affects mode of transmission, and which types of data provide strongest support for documenting oncogenic potential for humans. Prerequisites: PUBH 6003.

**PUBH 6273. Ethnographic Methods. 1 Credit.**
Use ethnographic field methods in conjunction with epidemiological research. Introduction to specific methods used to examine health phenomena and determinants of disease. Learn specific applied skills that can be modified with socio-cultural modifications to evaluate urban sites and other settings. Basic skills in application of ethnographic methods, including recursive observations, participant observations, and variety of approaches to interviewing such as in-depth, structured and non-structured as well as conversational interviewing. Discuss use of multiple approaches in conjunction with ethnography, including focus groups, archival, document, statistical and secondary data analysis, and survey research methods. Course emphasizes use of ethnographic research methods in community-based health settings and evaluates issues in cultural competency and how to garner stakeholder support to conduct epidemiologic studies. Prerequisites: PUBH 6003.

**PUBH 6274. Emerging Infectious Diseases for Public Health Professionals. 2 Credits.**
Focus on epidemiology of emerging infectious diseases of public health importance, including factors leading to their development, management of emerging infectious diseases from a public health and laboratory standpoint, including biosafety, and strategies for emergency preparedness from a national and international perspective. Emphasis on the context of emerging infectious diseases and strategic approaches to their containment. Prerequisites: PUBH 6003 or MICR 6292; or permission of the instructor.

**PUBH 6275. Essential Public Health Laboratory Skills. 2 Credits.**
This course provides public health students with practical laboratory experience Prerequisites: MICR 6239 or permission of the instructor.

**PUBH 6276. Public Health Microbiology. 3 Credits.**
Gain in-depth understanding of important non-viral pathogens pertinent to public health microbiology. Learn how to isolate and identify pathogens using critical thinking and problem solving skills.

**PUBH 6278. Public Health Virology. 3 Credits.**
In-depth understanding of viral pathogenesis by focusing on current research, controversial issues, and public health relevance. Survey of family of viruses most relevant to today's public health efforts, concentrating on virus-host interactions and therapeutic strategies.

**PUBH 6279. Next Generation Sequencing Laboratory Skills. 2 Credits.**
Wet lab-based course covering next-generation sequencing technology as well as primer and probe design and nucleic acid sequence searches. Permission of the instructor is required prior to enrollment.

**PUBH 6280. Microbiology and Emerging Infectious Diseases Final Project. 2 Credits.**
Focus on the synthesis and summary of data acquired through epidemiologic and/or public health laboratory research. Biosafety training, CITI training, HIPAA training and permission of the instructor are required prior to enrollment. Prerequisites: PUBH 6002, PUBH 6003. Corequisites: PubH 6247, PubH 6853.

**PUBH 6281. Analysis of Complex Surveys Using SAS and Stata. 2 Credits.**
Appropriate methods to analyze survey data collected using complex sampling methods are discussed and applied to national survey data to address provocative public health research questions. Prerequisites: PUBH 6003 and PUBH 6853.

**PUBH 6282. Introduction to R Programming for Epidemiology. 1 Credit.**
Mid-level training in R programming including data manipulation, visual display of data and summarizing, and analyzing data. Constructs in R using objects and its graphical capabilities will be presented. Prerequisites: PUBH 6853. Recommended background: Programming experience in a statistical package such as Stata or in high level language such as C, Python, Perl.

**PUBH 6284. Perinatal Epidemiology. 1 Credit.**
Current research, controversial issues, and methodological problems in the epidemiology of perinatal health, including complications of pregnancy, adverse pregnancy outcomes, and birth defects. Prerequisites: PUBH 6003.

**PUBH 6291. Infection and Immunity. 3 Credits.**
Introduction to the basic principles of the immune system, host defense to infectious disease, and microbial pathogenesis. Restricted to students in the MS in public health microbiology and emerging infectious disease program. Credit cannot be earned for this course and MICR 8210.

**PUBH 6299. Topics in Epidemiology. 3 Credits.**
Topics vary by semester. May be repeated for credit provided the topic differs. Consult the Schedule of Classes for more details.

**PUBH 6305. Fundamentals for Health Policy: Public Health and Health Care. 2 Credits.**
An overview of public health and health care in the United States as an introduction to the study and analysis of health policy. Presents the governmental framework, institutions, financing streams, workforce, constituencies, and interest groups engaged in the health sector to ensure that students begin their policy analytic training with grounding in the political, economic, and social realities of public health and health care.

**PUBH 6310. Statistical Analysis in Health Policy. 3 Credits.**
Quantitative and statistical methods of data analysis for health policy and health services research. Instruction in conducting data analyses using Stata statistical and data analysis software and application of acquired skills to health policy and health services research. Practical experience in programming and analysis of various health policy-related questions. Entering and importing data; creating, saving, and merging data sets; creating and modifying variables; labeling variables and values; and conducting analysis ranging from univariate to multivariate analyses, including multiple regression and logistic regression. The use of existing data sets to analyze health policy issues and interpret these analyses for policy purposes. Prerequisite: PUBH 6002.

**PUBH 6315. Introduction to Health Policy Analysis. 2 Credits.**
Core elements of health policy analysis: problem definition, background, the political, economic, and social landscape; development of policy options and recommendations. Written, graphic, and oral presentation skills associated with policy analysis. Summer, Fall, Spring Prerequisites: PUBH 6012 or PUBH 6305.

**PUBH 6320. Advanced Health Policy Analysis. 3 Credits.**
Practical applications of basic quantitative tools in health policy. Problem definition; political, social, and economic assessment of a problem; program evaluation and data analysis; development of policy options; and the written and oral presentation of findings and recommendations. Prerequisites: PUBH 6305 or PUBH 6012; and PUBH 6310 and PUBH 6315.

**PUBH 6325. Federal Policymaking and Policy Advocacy. 2 Credits.**
The federal health policymaking process, including an overview of the legislative, administrative, and judicial processes that affect policymaking; federal budget, authorization, and appropriation processes; common techniques and strategies used to advance legislative and regulatory policies, including coalition building and the use of policy studies and media relations. Prerequisites: PUBH 6012 or PUBH 6305.

**PUBH 6330. Health Services and Law. 3 Credits.**
Examination of how US law/legal system influences the health care system. How various sources of law embody health policy and affect access, quality, financing of health care and the regulation of patient rights. Prerequisites: PUBH 6012.

**PUBH 6335. Public Health and Law. 3 Credits.**
How the law can both promote public health and conflict with the rights of individuals protected under the U.S. Constitution; legal concepts that underlie the public health system and inform public health policymaking; major areas of public health activity; the future of public health.

**PUBH 6340. Health Economics and Finance. 3 Credits.**
Examination of economic principles as they apply to health policy in the public and private sectors. The basic framework of economics is used to analyze the behavior of consumers, hospitals, physicians, and insurers, as well as pharmaceutical companies and long-term care providers. Overview of Medicare and Medicaid. Economic analyses of current issues in the marketplace, including rising health spending in the context of the national economy and the federal budget, insurance market dynamics, key issues in the long-term care industry, shifting market forces and power within the health care arena, and new payment initiatives and delivery system models. Prerequisites: PUBH 6352 or an undergraduate economics course.

**PUBH 6345. Health Policy Research Design. 2 Credits.**

**PUBH 6350. Health Policy Capstone. 2 Credits.**
Required for MPH graduate students in the health policy concentration in the final semester before graduation. Students synthesize and integrate knowledge across multiple public health disciplines; apply theories, principles, and skills in ways that approximate professional practice in the field of health policy; and demonstrate mastery of the required knowledge and competencies addressed in the curriculum. Prerequisites: PUBH 6012 or PUBH 6305; and PUBH 6320.

**PUBH 6352. Basics of Economics for Health Policy. 1 Credit.**
An introduction to modern microeconomics -- the study of how consumers, firms, industries, and the public sector make decisions and allocate their resources in the economy. The principles of supply and demand and elasticity in both the private and public sectors are analyzed.

**PUBH 6353. Child Health Advocacy. 1 Credit.**
Introduction to child health advocacy. Affordable Care Act (ACA), preventive care, school health, environmental issues, and emergency care. The use of data for advocacy.

**PUBH 6354. Substance Use Disorder Policy. 2 Credits.**
Trains students to think critically about a variety of policy issues related to substance use disorder in the United States, with a particular focus on the current opioid epidemic. Prerequisites: PUBH 6006 or PUBH 6012 or PUBH 6305.

**PUBH 6355. Comparative Health Policy. 2 Credits.**
Archetypical health care systems, financing, and reform efforts, with emphasis on the trade-offs between efficiency and equity. Comparison of current policy challenges and solutions faced by policymakers in the U.S. and in other countries. Prerequisites: PUBH 6012 or PUBH 6305.

**PUBH 6356. State Health Policy. 2 Credits.**
Replicates the experience of a policy staff member for a health-focused organization or state agency learning the requirements for the position and the fundamental roles their state has in health policy. Prerequisites: PUBH 6012 or PUBH 6305.

**PUBH 6357. Health Economics and Policy: Cost Containment Strategies. 2 Credits.**
Health care cost containment in the context of the current implementation of national health reform. Cost containment strategies; economic underpinnings, anticipated impacts, perspectives of and implications for health care providers and systems, and political considerations. Prerequisite: PUBH 6340.

**PUBH 6358. Vaccine Policy. 2 Credits.**
The development of U.S. vaccine policy and the growth of various markets targeting routine vaccination of all populations; interactions among business, legal, political, public health, medical, federal/state/local government, and consumer communities that combine to influence vaccine delivery in a broad range of settings. Prerequisites: PUBH 6012 or PUBH 6305.

**PUBH 6359. Reproductive Health Policy. 1 Credit.**
Overview of reproductive health policy at the federal and state levels. Balancing the interests of competing stakeholders; the fundamental underlying role of significant disparities in financing for and access to reproductive health services; and how policymaking can alleviate or exacerbate preexisting issues.

**PUBH 6360. Advanced Maternal and Child Health Policy. 1 Credit.**
In-depth exploration of maternal and child health policy in the U.S., with a particular emphasis on the role of personal and public health services for women, children, youth and their families in the context of health and human services system change. Prerequisite: PUBH 6561.

**PUBH 6361. Health Workforce Policy. 2 Credits.**
Strategies for the prevention and control of infectious diseases, focusing on low and middle income countries. Goals, strategies, and challenges of major global health intervention programs. Surveillance systems, vaccination programs, chemotherapy as a prevention and treatment tool, nutritional supplementation, environmental approaches, and potential benefits of integrating multiple interventions. Prerequisites: PUBH 6012 or PUBH 6305.

**PUBH 6363. The Healthcare Legislative Process. 1 Credit.**
How healthcare legislation is developed in and moves through the U.S. House of Representatives and Senate. The roles of the committees of jurisdiction in each house and how the rules of each house affect legislative outcomes.

**PUBH 6364. Federal Budget Process for Health Policy. 1 Credit.**
Focuses on how the Congressional budget process shapes the funding and design of federal health care programs, ranging from entitlement programs like Medicare to appropriated programs like community health centers. Discussions cover budget resolutions, appropriations bills, and budget reconciliation legislation, as well as Congressional procedures and committees through which they are considered. Prerequisite: PUBH 6305.

**PUBH 6366. Healthcare Corporate Compliance. 2 Credits.**
The federal laws and regulations that affect the U.S. healthcare industry participants, particularly those relating to the prevention of fraud and abuse, and the role of corporate compliance programs. Prerequisites: HSML 6215 or PUBH 6330.

**PUBH 6367. Population Health, Public Health, and Health Reform. 2 Credits.**
In-depth assessment of how a reforming health care system can be expected to change the policy landscape for population and public health in the United States; direct changes evolving at the state and local level and national payment and health system reforms. Prerequisites: One of the following: HSML 6202, PUBH 6006, PUBH 6012, or PUBH 6305.

**PUBH 6368. Law, Medicine, and Ethics. 3 Credits.**
Legal, ethical, and policy issues that arise in the biomedical arena; the definitions of life and death, the nature of personal identity, the requirements of justice, and the boundaries of liberty. Prerequisites: PUBH 6330 or PUBH 6335.

**PUBH 6370. Medicare/Medicaid Law and Policy. 2 Credits.**
Describes current legal and public policy issues in the Medicare and Medicaid programs, including the legal, operational, financial, and organizational rules for the two programs. Prerequisite: PUBH 6315.

**PUBH 6372. Minority Health Policy. 2 Credits.**
Introduces students to the concept of health disparities and the implications of disparities for health care practice and policy. Students will learn how disparities are defined and measured, as well as emerging approaches in practice and policy to reducing disparities. Fall. Prerequisite: PUBH 6315.

**PUBH 6374. Pharmaceutical Policy. 2 Credits.**
Legal and regulatory frameworks related to the demand for and supply / quality of pharmaceutical products. Policies specific to drug development, pricing, reimbursement, use, dissemination of information, and post-marketing surveillance. Prerequisite: PUBH 6315.

**PUBH 6376. Primary Healthcare Policy. 2 Credits.**
Politics and policy behind the provision of primary healthcare in the US. Rise of the field of primary care and how it is supported and financed; role of insurers and government in regulation and oversight in the areas of access, cost, and quality. Prerequisites: PUBH 6012.

**PUBH 6378. HIV Policy in the US. 2 Credits.**
Examines the policy response to the HIV epidemic in the United States and how the epidemic itself has helped to shape U.S. policy. How and why HIV became a national policy issue; circumstances surrounding the discovery of and early response to HIV; and main policy and programmatic developments and key players over time. The role and implications of the Affordable Care Act for individuals with HIV, the future of the Ryan White HIV/AIDS Program, and the impact of new treatment and prevention strategies on the future course of the epidemic.

**PUBH 6380. Bridging Health Policy and Health Information Technology. 2 Credits.**
Basics of health care informatics policy and core technological components for health services managers, public health professionals, health policy analysts, and health information technology staff. Policy and legal frameworks, governance and financial issues, technological infrastructure, and business and technological operations. Concepts and roles of information and how information technology can support the health care industry in promoting quality improvement.

**PUBH 6382. Community Health Center Policy. 2 Credits.**

**PUBH 6384. Health Care Quality and Health Policy. 2 Credits.**
The role of quality in the U.S. health care delivery system from the perspective of multiple stakeholders, including public and private payers, providers, consumers, and employers. Defining and measuring quality; how quality information is used; and policy implications of quality improvement. Recent changes under health reform legislation. Prerequisites: PUBH 6012 or PUBH 6305.

**PUBH 6386. Public Health Preparedness Policy. 2 Credits.**
Issues in public health emergency preparedness and response at the nexus of homeland and national security. The relationship between public health and criminal investigation, forensic epidemiology, and surveillance; biodefense; and the role of the scientific community. Infrastructure, threat themes, and associated preparedness and response policy.

**PUBH 6390. Prescription Drugs: Policy and Public Health. 3 Credits.**
Key policies and public health programs related to each stage of a prescription drug's life cycle; Congressional funding focused on speeding the development and approval of needed drugs, public and private approaches to increase access to prescription drugs, and exceptions to international laws that allow some countries to violate prescription drug patents to improve the health of impoverished citizens.

**PUBH 6399. Topics in Health Policy. 3 Credits.**
In-depth examination of a particular facet of public health policy. Topics and prerequisites vary.

**PUBH 6400. Global Health Frameworks. 2 Credits.**
Overview of current issues in global public health with particular emphasis on low and middle-income countries. Serves as both an introductory course for students entering the field of global health, as well as an update on current technical and policy issues for advanced students who may have considerable experience.

**PUBH 6410. Global Health Study Design. 1,2 Credit.**
Tools necessary for designing and understanding the research that goes into developing good public health programs; basic elements for the planning and design phase of a research project. Prerequisite or corequisite: PUBH 6009 or PUBH 6501. Prerequisites: PUBH 6003.

**PUBH 6411. Global Health Qualitative Research Methods. 2 Credits.**
An introduction to qualitative data collection and analysis in global health settings. Methodologies include survey design, interviews, focus groups, and participant observation. Archival research and clinical trial research are also addressed. The set of methods most commonly used to collect qualitative data in global health settings. Students are enabled to prepare interview guides, conduct in-depth interviews, and analyze and document the results from a qualitative field project. Prerequisites: PUBH 6002 and PUBH 6410.

**PUBH 6412. Global Health Quantitative Research Methods. 3 Credits.**
Continuation of the series of global health methods courses. Examination of the fundamental concepts of empirical analysis and qualitative analysis, including open and axial coding, the basis of grounded theory, and regression analysis. Prerequisites: PUBH 6002 and PUBH 6410.

**PUBH 6416. Ethical and Cultural Issues in Global Health Research and Programs. 1 Credit.**
Examine procedures and concerns for protecting communities and human subjects involved in public health programs and research. Consider cultural considerations integral to ethical conduct of public health research and programming in the global context. Discuss history behind rules and regulations that govern ethical principles around conduct of research involving human subjects. Consider contribution that awareness of cultural contexts where we work makes to ethical nature of our work as global health professionals.

**PUBH 6417. Cross-Cultural Approaches for Global Health Practice. 1 Credit.**
How to communicate, negotiate, and be more effective across cultures; social aspects that affect communication within cultures and how to navigate communication in practical situations including in the work place and in risk and crisis situations. Corequisite: PUBH 6410. Prerequisite: PUBH 6416.

**PUBH 6418. Global Health Culminating Experience I. 1 Credit.**
First in a two-course sequence providing structured process for global health students to complete the proposal phase of their final, integrative learning experience/project for the MPH program. Restricted to students in the MPH in global health program.

**PUBH 6419. Global Health Culminating Experience II. 1 Credit.**
Second in a two-course sequence. Students apply their public health training to a real-world global health challenge integrating the knowledge, skills, methods, and principles learned in the MPH program. Restricted to MPH students in the global health program. Prerequisites: PubH 6418.

**PUBH 6420. Understanding Commercial Determinants of Health. 1 Credit.**
Conceptual understanding and frameworks for commercial determinants of health as key to improving public health.

**PUBH 6421. Responsible Conduct of Research. 1 Credit.**
Designed to raise awareness of the responsible conduct of research. Strategies for preventing irresponsible research practices, including unacceptable practices and research misconduct.

**PUBH 6422. Injury and Global Public Health. 1 Credit.**
Provides a snapshot of different injury topics, both domestic and international, through a public health lens.

**PUBH 6423. Ethics in Public Health Practice and Policy. 1 Credit.**
Provides training on the basics of public health ethics and the process of ethical analysis. Describes tools and resources for addressing ethical challenges that commonly arise in the practice of public health.

**PUBH 6430. Theories for Global Health Communication Interventions. 2 Credits.**
Use of communication theory and methods in health promotion. Integration of multidisciplinary approaches to public health communication. Prerequisites: PUBH 6007 and PUBH 6400.

**PUBH 6431. Global Health Communication Strategies and Skills. 3 Credits.**
Students conduct qualitative research to evaluate health communication programs, assess readability level and suitability of written health education materials, conduct content analyses, and review/critique current health communication literature. Prerequisites: PUBH 6430 or permission of the instructor; and PUBH 6007.

**PUBH 6435. Global Health Program Development and Implementation. 2 Credits.**
Basic concepts and principles of program development and implementation including data collection methods, decision making, and problem-solving techniques. Application of program development techniques to specific interventions. Prerequisite: PUBH 6400.

**PUBH 6436. Global Health Program Management and Leadership. 2 Credits.**
Essential tools for successful project, personnel, and program management. Leadership and management theory; key issues in managing global health programs and projects; leadership and management skills development; use of data in management decision making; and importance of quality, supply chain, and resource management. Restricted to students in the MPH in global health program design, monitoring, and evaluation program. Prerequisites: PUBH 6400 and PUBH 6435.

**PUBH 6437. Global Health Program Evaluation. 3 Credits.**
Fundamentals of program monitoring and evaluation; developing and using program theory in evaluation; impact evaluation and mixed-methods approaches; qualitative methods and statistical analysis for program evaluation. Prerequisites: PUBH 6002.

**PUBH 6440. Global Health Economics. 2 Credits.**
Principles of economics as they apply to global health. Provides a toolkit for analyzing related issues. Application of this toolkit to global health issues, such as demand for health, healthcare financing, social insurance, and HIV/AIDS. Prerequisites: PUBH 6400.

**PUBH 6441. Global Health Organizations and Regulations. 3 Credits.**
Introduction to the structure and dynamics of the global health system. The principal topics include the structure of the global health systems and global health regulations. Prerequisites: PUBH 6400.

**PUBH 6442. Comparative Global Health Systems. 2 Credits.**
Examination of national health systems, how they differ, and how they are performing. Health systems analyzed through four different lenses: health care organizations, health workforce development, health care financing, and health policy development. Comparison of health systems and health reforms in seven regions of the world and assessment of how health system performance might be improved. Course fee may apply. Prerequisite: PUBH 6400.

**PUBH 6443. Global Health Agreements and Conventions. 2 Credits.**
Explores the impact of regulations, trade and human rights on health by examining the relevant international declarations, agreements and conventions. This course examines a variety of topics including the impact of international trade agreements on health, the International Health Regulations and other regulations affecting global health, and the relationship between health and human rights. Prerequisite: PUBH 6400.

**PUBH 6445. Quantitative Methods for Impact Evaluation. 3 Credits.**
Review of a variety of quantitative techniques and research designs used to uncover causal effects of policies and programs, with applications to public health topics. Includes Stata-based labs for implementing these techniques. Prerequisites: PUBH 6002, PUBH 6003, and PUBH 6412.

**PUBH 6447. Global Health Policy Analysis. 2 Credits.**
The praxis of global health policy analysis from the local to global levels. Students are equipped with the basic tools needed for policy analysis of health conditions and health systems problems in support of decision making. Prerequisites: PUBH 6012 and PUBH 6400.

**PUBH 6450. Global Health Diplomacy. 2 Credits.**
Introduction to the concept of global health diplomacy; how diplomacy has been used to advance health agendas and how health issues have been used to improve diplomatic relations between countries; formal health, multi-stakeholder health, and informal health diplomacy; comparative study of how different countries have devised health diplomacy strategies.

**PUBH 6451. Monitoring/Evaluation of Sexual/ Reproductive Health Programs in Low- and Middle- Income Countries. 2 Credits.**
Overview of key sexual and reproductive health challenges in low- and middle-income countries; designing and measuring programs to address those challenges. Taught from the perspective of applied researchers working within an organization that implements sexual and reproductive health programs and services. Prerequisites: PUBH 6437, PUBH 6500 and PUBH 6503.

**PUBH 6452. Social and Behavior Change Communication in Middle- to Low-Income Countries. 2 Credits.**
The ways in which behavior change and sociocultural theories underpin the development of SBCC programs in politically, culturally, and socially diverse settings. Prerequisites: PUBH 6007 and PUBH 6503.

**PUBH 6455. Global Vaccinology. 3 Credits.**
Concepts, methods, and tools for making new and existing lifesaving vaccines more accessible to individuals in low- and middle- income country settings. Recommended for second-year MPH students. Prerequisites: PUBH 6002 and PUBH 6003.

**PUBH 6461. Ethics and Accountability in Humanitarian Settings. 1 Credit.**
Principles and fundamentals of ethical approaches and accountability processes in the delivery of humanitarian services and possible solutions and interventions to address them. PUBH 6480 may be taken as a corequisite. Prerequisite: PUBH 6480.

**PUBH 6462. Nutrition and Food in Large Humanitarian Emergencies. 1 Credit.**
Fundamentals of food aid programs and nutritional issues in emergency humanitarian situations and appropriate local and international responses in lower-income countries. Field-based program responses in international, resource-scarce settings, as conducted by NGOs and UN agencies. PUBH 6480 may be taken as a corequisite. Prerequisite: PUBH 6480.

**PUBH 6463. Communication Strategies and Planning in Humanitarian Settings. 2 Credits.**
Principles of and major challenges in communication planning with wide range of stakeholders in humanitarian settings; solutions and interventions to identify related risks and appropriately respond to and effectively plan communication strategies. PUBH 6480 may be taken as a corequisite. Prerequisites: PUBH 6007 and PUBH 6480.

**PUBH 6464. Mental Health in Humanitarian Settings. 1 Credit.**
Principles of and fundamental challenges to mental health in humanitarian settings, including potential solutions and interventions; foundational knowledge and skills in mental health and psychosocial support services in such settings. PUBH 6480 may be taken as a corequisite. Restricted to PUBH 6480.

**PUBH 6465. Reproductive Health and Gender-Based Violence in Humanitarian Settings. 1 Credit.**
Key issues, challenges, policies, and interventions related to sexual and reproductive health and gender-based violence in humanitarian settings for persons affected by armed conflict and natural disasters. PUBH 6480 may be taken as a corequisite. Prerequisite: PUBH 6480.

**PUBH 6466. Health Financing in Low- and Middle-Income Countries. 2 Credits.**
Foundational approaches to analyze and strengthen health financing in low- and middle-income countries. Addressing structure of health financing systems; health financing reforms; global health financing; and analytic data for policy design. Prerequisites: PubH 6400.

**PUBH 6467. Humanitarian and Disaster Response Principle, Practice, and Operational Challenges. 3 Credits.**
Principles and fundamentals of ethical approaches and accountability processes in the delivery of humanitarian services. Important or controversial contemporary topics in humanitarian and disaster settings. Corequisites: PUBH 6480.

**PUBH 6468. Preparation and Response to Epidemics, Pandemics, Mass Health Emergencies, and Disasters. 2 Credits.**
Principles and fundamentals of preparation and response to epidemics, pandemics, and other mass health emergencies from both national and international perspectives.

**PUBH 6469. Humanitarian Aid Seminar Series. 1 Credit.**
Targeted talks and panel discussions with humanitarian aid workers from a variety of agencies addressing important or controversial contemporary topics in humanitarian settings. Corequisite or prerequisite: PUBH 6480.

**PUBH 6470. Topics in Global Public Health and Human Rights. 1 Credit.**
Application of human rights approaches to fundamental disciplines, target populations, and disease priorities in global public health.

**PUBH 6474. Health Systems Research in Low- and Middle-Income Countries. 2 Credits.**
Theory-driven approaches for designing, executing, and analyzing health systems research in low- and middle-income countries. Doctoral students must enroll simultaneously in PUBH 8474. Prerequisites: PUBH 6009 and PUBH 6012.

**PUBH 6475. Theory Building in Health Systems Research. 2 Credits.**
Conceptualize, develop, represent, and communicate theory-driven health programs, and inform evaluations to determine what are the effects of an intervention. How such effects are produced; why they are or are not produced, and for whom.

**PUBH 6476. Theory-Driven Evaluation. 2 Credits.**
Intermediate skills-building course for designing theory-driven evaluations aimed at learning about the effects of a policy or program, under what conditions are they produced, who benefits, and why. Corequisites: Doctoral students are advised to take this course concurrent with PUBH 8476. Credit cannot be earned for this course and PUBH 6475.

**PUBH 6477. Structural Racism and Public Health. 2 Credits.**
The social construct of race and the history of structural racism, colonialism, and white supremacy applied to public health research, policy, and practice. The role of structural racism in public health outcomes and community health.

**PUBH 6478. Health System Quality Measurement in Global Health. 2 Credits.**
Definitions and frameworks for health system quality, dimensions of quality, data collection methods to assess quality, global quality measurement efforts, quality metrics by health condition and by health system platform, and more.

**PUBH 6480. Public Health in Humanitarian Settings. 2 Credits.**
Technical aspects of high-priority public health interventions; consideration of how and why sound public health interventions should be implemented in both emergency and chronic humanitarian settings; the roles of diverse humanitarian actors.

**PUBH 6481. Global Mental Health. 2 Credits.**
Focus on global mental health knowledge and public health policy implementation skills regarding the integration of mental health, public health, and primary care in diverse health systems and challenging cultural contexts. Prerequisite: PUBH 6400.

**PUBH 6482. International Food and Nutrition Policy. 2 Credits.**
Major global food and nutrition issues, their determinants, and the strategies that in place to address them. Students identify major nutrition and food challenges in a country or region as well as the policies and programs that have proven successful in addressing those challenges. Prerequisite: PUBH 6400.

**PUBH 6484. Prevention and Control of Vector Borne Diseases. 2 Credits.**
Study of insects and other vectors responsible for transmission of diseases in developing countries, including plague, malaria, dengue fever, onchocerciasis (river blindness), and chikungunya virus. Special focus on developing countries, particularly in the Middle East, Africa, Asia, and Latin America. Diseases such as West Nile Virus and Lyme disease in the United States and elsewhere are also addressed. New methods for effective management and control.

**PUBH 6486. Global Health Programs and Approaches to the Control of Infectious Diseases. 2 Credits.**
Strategies for the control of infectious diseases with a focus on low and middle income countries; identifying and critiquing goals, strategies, and challenges of major global health intervention programs designed to prevent and control infectious diseases. Prerequisites: PUBH 6002 and PUBH 6003.

**PUBH 6487. Emerging Zoonotic Diseases and Global Food Production. 1 Credit.**
Analysis of trends in emerging zoonotic diseases and their links to global food production. Case studies on the use of surveillance systems and outbreak detection techniques to monitor emerging zoonotic diseases. Development of skills to analyze surveillance systems, policy reports, and literature related to emerging zoonotic diseases and food-borne outbreaks within a global context. Prerequisites: PUBH 6003.

**PUBH 6488. Cost-effectiveness Analysis in Public Health and Health Care. 2 Credits.**
The application of cost-effectiveness analysis (CEA) to enhance the efficiency of programs and services both in the United States and developing countries. A variety of topics and related analytical tools such as cost benefit analysis, decision analysis, and sensitivity analysis are covered. Students learn to perform cost-benefit and cost-effectiveness analyses and understand the strengths and limitations of these methods and how to apply them to a broad range of health issues.

**PUBH 6489. Evaluation of Food and Nutrition Programs and Policies. 1 Credit.**
Introduction to major global food and nutrition issues, strategies used to address these problems, and commonly-used program impact theories and evaluation frameworks; application of evaluation methods and approaches to nutrition and food programs and policies. Prerequisite: PUBH 6437.

**PUBH 6491. Public Health Leadership Seminar. 1 Credit.**
Leadership lessons derived from the careers of a diverse group of successful executives and entrepreneurs from multiple sectors, including corporate, government, nonprofit, and the arts. Development of skills for effective engagement with peers, personal network, potential employers, and business partners. Permission of the faculty member required prior to enrollment.

**PUBH 6492. Global Health Programs and Approaches to the Control of Chronic Diseases. 2 Credits.**
Concepts, methods, and tools to address chronic non-communicable diseases (NCDs); global public health and development dimension of NCDs, their epidemiology and risks, and health systems approaches for their control with focus on low- and middle-income countries. Prerequisites: PUBH 6002, PUBH 6003 and PUBH 6400.

**PUBH 6493. Fundamentals of Supply Chain Management in Developing Countries. 2 Credits.**
Practical approaches used by government policymakers, essential drugs program managers, NGOs, donors, and others to ensure that high-quality essential drugs are available, affordable and used rationally; existing and potential challenges and workable solutions related to managing the drug supply in developing countries. Restricted to graduate students.

**PUBH 6494. Population, Public Health Practice, and Sustainable Development. 2 Credits.**
The reciprocal connections between the dynamics of population growth, distribution, and age structure to health, well-being, and socioeconomic development.

**PUBH 6495. Field Trial Methods and Application. 2 Credits.**
Concepts, methods, and tools necessary to conduct community-based randomized trials in low- and middle-income country settings; the process of running a randomized field trial from selecting a topic, through implementation, to analysis and reporting. Most appropriate for students in their second year of study. Prerequisites: PUBH 6002 and PUBH 6003.

**PUBH 6496. Global Public Health and Human Rights Praxis: From Research to Practice and Policy. 1 Credit.**
Fundamental norms and principles of human rights and application to the understanding of global public health problems; emphasis on displaced populations and humanitarian contexts; strengths and limitations of human rights approaches to public health.

**PUBH 6499. Topics in Global Health. 3 Credits.**
Examination of a particular facet of public health. Topics vary by semester. May be repeated for credit provided the topic differs. Consult the Schedule of Classes for more details.

**PUBH 6500. Planning and Implementing Health Promotion Programs. 3 Credits.**
Students develop skills to effectively plan, design, and implement programs that address public health problems for defined populations in a variety of settings. Prerequisites: PUBH 6007.

**PUBH 6501. Program Evaluation. 3 Credits.**
The knowledge, competencies, and skills needed to plan and implement evaluations of public health programs in a variety of settings; types of program evaluation, including needs assessment, process evaluation, quantitative and qualitative monitoring of outputs, outcomes, and impact. Prerequisites: PUBH 6002, PUBH 6003 and PUBH 6007; and PUBH 6435 or PUBH 6500.

**PUBH 6502. Practical Data Analysis for Prevention and Community Health. 1 Credit.**
Practical aspects of dataset creation, data management, rudimentary statistical analysis and tabular/graphical presentation of results in the user-friendly environments of PASW (formerly SPSS) and MS Excel. Students create codebooks, enter and clean data, derive new variables from existing ones, choose appropriate analytical techniques and implement them, graph and tabulate results, and document and protect work. Examples are drawn from commonly-encountered situations in prevention and community health, such as needs assessments and program evaluations. Prerequisites: PUBH 6002, PUBH 6003 and PUBH 6500.

**PUBH 6503. Introduction to Public Health Communication and Marketing. 3 Credits.**
The application of health communication theories, principles and techniques, as well as marketing constructs and concepts, to advancing public health through practitioner-oriented health communication and social marketing campaigns and programs. Prerequisites: PUBH 6007; may be taken as a corequisite.

**PUBH 6504. Social and Behavioral Science Research Methods. 3 Credits.**
The processes of study design, data collection, and analysis using SPSS for quantitative research in prevention and community health. All phases of the observational/survey research process considered sequentially, from formulation of research questions to preparation of the final report. Prerequisites: PUBH 6002 and PUBH 6007; or permission of the instructor.

**PUBH 6508. Cost-Effectiveness Analysis of Health Promotion Interventions. 3 Credits.**
Theoretical basis for and practical skills needed to estimate the effectiveness, population impact, and cost of health promotion interventions; application to policy and cost-effectiveness and cost-utility analyses. Familiarity with basic algebra and statistics is assumed. Prerequisites: PUBH 6002 and PUBH 6003; and PUBH 6006 or PUBH 6012.

**PUBH 6510. Community Health Principles and Practice. 3 Credits.**
Introduces a systematic community-engaged process for addressing public health problems among defined populations in a variety of community settings.

**PUBH 6512. Community-Oriented Primary Care Policy and Issues. 2 Credits.**
Advanced work on community-oriented primary care (COPC) methods and policy, focusing on issues related to the provision of healthcare in underserved communities. Prerequisites: PUBH 6510.

**PUBH 6513. Community Health Management. 2 Credits.**
Management and development of community health services. Builds upon principles for management and community-oriented primary care. Prerequisites: PUBH 6003 and PUBH 6510.

**PUBH 6514. Preventing Health Disparities. 2 Credits.**
Provides students with an understanding of how social, political, and economic factors contribute to disparities (e.g. racial, ethnic, gender, and geographical) in health and health care and how to use evidence-based approaches to prevent or address health disparities.

**PUBH 6515. High Risk and Special Populations. 2 Credits.**
Provides students with an overview of the methods to plan, implement and evaluation health promotion and education programs targeted towards high risk and special populations. The course reviews the socioeconomic, political-economic, cultural and psychosocial factors of populations who are considered to be at high risk for specific health problems and efforts that have been addressed in current health promotion programs. Prerequisite: PUBH 6007.

**PUBH 6516. Community Health Information Resources. 2 Credits.**
COPC and community health promotion require diverse information skills in order to assess community needs and strengths, determine priority health issues, analyze data, plan interventions, and evaluate programs. This course introduces students to the information resources useful in planning and implementing COPC and community health projects that address racism. The selected resources support methods for defining a community, characterizing a community's social and health characteristics, investigating a prioritized problem, and developing programs and solutions. Students learn how to choose resources, search them, and consider bias in information sources.

**PUBH 6530. Qualitative Methods in Health Promotion. 2 Credits.**
Application of qualitative methods in the development of health promotion interventions, evaluations, and research. Collecting and analyzing qualitative date through participant observation, interviewing, group methods, and case studies. Prerequisite: PUBH 6007.

**PUBH 6531. Health Promotion in Healthcare Settings. 2 Credits.**
Behavioral change counseling and training skills to improve health by changing individuals' behaviors and by developing training materials for use with providers, health professionals and high risk groups. Advanced course for second-year students. Prerequisites: PUBH 6007 and PUBH 6500.

**PUBH 6532. Community Organization, Development, and Advocacy. 3 Credits.**
Educates health promotion practitioners in how to organize community groups to promote health. The focus is on learning how to use resources available in the community to advocate change. Prerequisite: PUBH 6007.

**PUBH 6533. Design and Conduct of Community Health Surveys. 2 Credits.**
This course teaches students how to frame questions in health promotion surveys using sound principles of questionnaire design with emphasis on reliability and validity. Students learn survey design principles and methods and how to analyze survey data.

**PUBH 6534. Community-Based Participatory Research. 2 Credits.**
Students learn to conduct community research in collaboration with community leaders and residents. Emphasis on principles of CBPR for addressing health promotion issues in communities, including administrative and policy changes.

**PUBH 6535. Promotion of Mental Health. 2 Credits.**
Increases understanding about issues in mental health promotion. The emphasis is on mental health as a public health issue and linkages between individual mental health and the environment. Prerequisite: PUBH 6007.

**PUBH 6536. Workplace Health Promotion. 2 Credits.**
Planning, management and evaluation of programs designed to serve employees' needs, promotion of employee health and reduction of health care costs in the workplace. Prerequisite: PUBH 6007.

**PUBH 6537. Health Promotion and Aging. 2 Credits.**
Introduces students to the basic health aspects of the aging process and special health promotion needs for this group. Problems of aging and public health solutions for older Americans are examined. Students are able to define the public health concerns for aging Americans, how aging is affected by a multitude of factors, identify health promotion strategies to assist in reaching out to this population and develop methods of collaboration with agencies and organizations to improve the health of the aging population. Prerequisite: PUBH 6007.

**PUBH 6540. Culture and Health. 2 Credits.**
Examines how culture shapes health issues and public health efforts globally. Explores research methods and case studies on HIV/AIDS, youth violence, obesity, and COVID-19 to understand cultural factors and implications. Prerequisites: PUBH 6007.

**PUBH 6550. Maternal and Child Health I. 3 Credits.**
Public health issues affecting the health and well-being of women, children, and families. A multidisciplinary perspective that integrates the biological, demographic, epidemiological, economic, behavioral, social, cultural and environmental aspects.

**PUBH 6551. Maternal and Child Health II. 3 Credits.**
Skills-based course focused on conducting research with an emphasis on assessing the individual, community, organizational, and societal needs of women, adolescents, and children Prerequisites: PUBH 6002.

**PUBH 6552. Women's Health. 2 Credits.**
Issues of women's health through the life cycle. The process of critically evaluating women's health research and issues.

**PUBH 6553. Adolescent Health. 2 Credits.**
Issues of physical, mental, and social development and their bearing on the health of adolescents, with special emphasis on prevention.

**PUBH 6554. Children and Youth with Special Needs. 2 Credits.**
In order to place children and youth with special needs into a public health framework, this course presents an introduction to and an overview of children and youth with special needs due to a developmental disability. Many aspects of developmental disability are addressed including 'concept' and definitions of disability, causes, epidemiological considerations, and development of federal legislation. The scope and range of developmental disabilities are reviewed along with classification schemes. Both national and international distributions are considered from a sociopolitical viewpoint.

**PUBH 6555. Reproductive Health: U.S. and Global Perspectives. 2 Credits.**
Reproductive health from a variety of public health perspectives, from defining reproductive health, past perspectives, needed improvements, and the factors that influence reproductive health.

**PUBH 6556. Maternal and Child Nutrition. 2 Credits.**
Covers the nutritional needs of women during the child bearing years, infants, children and adolescents. The course emphasizes the life course approach to nutrition and has a special emphasis on the effects of diet during infancy on obesity and degenerative diseases in later life. Students examine the biological basis of nutrition, identify risk factors associated with poor nutrition in individuals and populations and evaluate domestic and international programs. Summer (1 credit) and Spring (2 credits)

**PUBH 6557. Child Development and Public Health. 2 Credits.**
Examination of the development of children from a public health perspective and provide a detailed examination of the indicators of children's health that are needed to assist public health professionals improve children's health.

**PUBH 6558. Women, Gender, and Health. 2 Credits.**
Focuses on gender as a social determinant of health. Emphasis placed on examining the frameworks that are used in public health research to understand gender-based issues and how these frameworks affect the types of programs and intervention efforts developed.

**PUBH 6559. HIV Prevention: An Interdisciplinary Approach. 2 Credits.**
Provides an interdisciplinary overview of HIV prevention research from the behavioral, biological and biomedical perspective. Students are encouraged to approach the assignments and discussions from their own particular expertise and career interests/goals.

**PUBH 6560. School Health and Safety. 2 Credits.**
Examines the history, organization, financing, and politics of school health programs. Provides an overview of the core components of school health defined by the CDC's Whole School, Whole Community, Whole Child (WSCC) model.

**PUBH 6561. Maternal and Child Health Policy Analysis. 2 Credits.**
Provides instruction in maternal and child health policy in the U.S. with a particular emphasis on policies related to the organization, financing, delivery, and quality oversight of personal health services for mothers and children.

**PUBH 6562. Physical Activity and Dietary Interventions for Promoting Healthy Weight. 2 Credits.**
Examination of behavioral, medical, and surgical interventions; equity impact and systems; youth; climate and environment; and policy. Evaluating the necessary components of interventions and applying that knowledge to future programmatic efforts.

**PUBH 6563. Global Child Health. 2 Credits.**
Elements of science, policy, challenges, and successes of global child health; focus on low and middle income countries and children under five years of age. Learn the burden of disease and associated risk factors; cost-effective interventions and tools. Restricted to graduate students.

**PUBH 6564. Maternal and Child Health Culminating Experience Proposal Development. 1 Credit.**
Synthesize and integrate knowledge acquired in coursework and apply theory and principles to a situation that approximates professional practice. Demonstrate mastery of the body of knowledge and proficiency in the required MPH and MCH competencies. Restricted to students in the MPH in maternal and child health program. Prerequisites: PUBH 6000, PUBH 6002, PUBH 6003, PUBH 6007, PUBH 6011, PUBH 6012, PUBH 6021, PUBH 6022, PUBH 6500, and PUBH 6550. Recommended background: Online training courses on research with human subjects (CITI) and personal health information (HIPAA).

**PUBH 6565. Maternal and Child Health Culminating Experience. 1 Credit.**
Synthesize and integrate knowledge acquired in coursework and apply theory and principles to a situation that approximates professional practice. Demonstrate mastery of the body of knowledge and proficiency in the required MPH and MCH competencies. Restricted to students in the MPH in maternal and child health program. Prerequisites: PUBH 6000, PUBH 6002, PUBH 6003, PUBH 6007, PUBH 6012, PUBH 6022, PUBH 6500, PUBH 6550, and PUBH 6564. Recommended background: Online training courses on research with human subjects (CITI) and personal health information (HIPAA).

**PUBH 6570. Advanced Public Health Communication: Theory and Practice. 3 Credits.**
Focuses on the use of communication to positively influence people's – and population's – understanding of health information, decision-making, and health behavior. Students study, and in a group project apply, a range of theories and techniques germane to effective message design and delivery. Prerequisite: PUBH 6503.

**PUBH 6571. Social Marketing: Theory and Practice. 3 Credits.**
The use of marketing to change the behavior of people, populations, and policy makers in ways that are in their, and society's, best interests. Students in this skills-based course study and work in teams to apply a range of marketing strategies to a real-world situation. Prerequisite: PUBH 6503.

**PUBH 6572. Marketing Research for Public Health. 3 Credits.**
The use of marketing research techniques used to better understand customers of public health programs in order to improve program design, implementation, and effectiveness. A range of qualitative and quantitative techniques are studied for their relevance to program planning, development, and continuous improvement.

**PUBH 6573. Media Advocacy for Public Health. 3 Credits.**
Focuses on the use of communication to positively influence public policy and public opinion. In this skills-based course students study and apply a range of theories and techniques germane to the policy advocacy process. Prerequisite: PUBH 6503.

**PUBH 6574. Public Health Branding: Theory and Practice. 2 Credits.**
This course focuses on the use of branding in the public health and social sectors. Learning from the commercial sector, we examine how to brand behaviors as well as products and services. We review branding methods, examine research on branding and its effectiveness, and build skills in branding for public health objectives.

**PUBH 6575. Communication Skills for Public Health Professionals. 1 Credit.**
Helps students develop writing and oral presentation skills through intensive, interactive training, practice, and feedback. Provides participants with a solid foundation for all forms of public health and other scientific and technical written and oral communication.

**PUBH 6578. Generative AI Applications in Health Promotion. 2 Credits.**
Application of large language models and generative AI (GenAI) for health promotion and behavior change strategies. Conceptual, ethical, and policy-related issues of using, developing, and evaluating GenAI chatbots for health promotion. Prerequisites: PUBH 6007.

**PUBH 6579. Health Misinformation in the Digital Ecosystem. 2 Credits.**
Examines the production, spread, and potential impacts of health misinformation in digital environments. Equips students with skills to analyze, counter, and prevent misinformation across platforms and populations.

**PUBH 6590. Introduction to Social Entrepreneurship. 2 Credits.**
Examine innovative organizations created to improve people's lives and contribute to improved social and economic conditions. Emphasis on how such organizations are started, how they are sustained, and the various business models that are adopted to achieve an organizational mission.

**PUBH 6591. PA/MPH Clinical Leadership Seminar. 1 Credit.**
For first-year physician assistant and master of public health program students, an orientation to their roles as health professionals. Special emphasis on preventive and community medicine.

**PUBH 6599. Topics in Prevention and Community Health. 3 Credits.**
In-depth examination of a particular facet of prevention and community health. Topics and prerequisites vary.

**PUBH 6610. Public Health Nutrition Practice and Leadership. 1 Credit.**
This course provides an overview of public health nutrition practice. Students develop communication, management and leadership skills necessary for successful careers. Students also explore potential practicum and culminating experience options, and how to use these experiences to achieve their career goals. This course is designed for first year students in the public health nutrition MPH program.

**PUBH 6611. Nutrition Assessment. 2 Credits.**
The anthropometric, biochemical, clinical, and dietary methods for assessing nutritional status in individuals. The process of conducting food and nutrition environment assessments. Prerequisites: EXNS 2119 or PUBH 6619; or other equivalent course with permission of the instructor.

**PUBH 6612. Food Systems in Public Health. 2 Credits.**
A systems approach to understanding food systems and associated public health issues. How the current food system evolved, and how issues such as climate change and population growth may affect food systems in the future. The role of public health practitioners in meeting the population's need for safe, sufficient, and nutritious food. Policies, programs, and proposals aimed at creating healthier, more sustainable food systems.

**PUBH 6613. U.S. Food Policy and Politics. 2 Credits.**
The programs, regulations, and legislation that pertain to food production, food safety, nutrition assistance, and dietary guidance in the United States at the federal, state, and local levels.

**PUBH 6614. Study Design and Analysis in Nutritional Epidemiology. 2 Credits.**
Provides insights into study designs and data analyses in nutritional epidemiology and training in the critical interpretation of the results. For graduate students with prior training in nutritional assessment and epidemiology.

**PUBH 6619. Fundamentals of Nutrition Science. 3 Credits.**
The fundamental scientific principles of human nutrition; improving diet and nutritional status in the broader context of public health; nutrition assessment, study designs in nutrition science research, the role of nutrition in chronic disease, and current topics in nutrition science.

**PUBH 6620. Designing Healthy Communities. 2 Credits.**
Issues at the intersection of public health and planning; evaluating needs and creating change in communities facing food access, physical activity, and age related challenges; the built environment as a means of improving health and preventing chronic disease.

**PUBH 6630. Physical Activity and Nutritional Drivers of Cardiometabolic Disease. 2 Credits.**
Examine the independent and joint contributions of physical inactivity and suboptimal nutrition to the development of cardiometabolic diseases in children and adults. Prerequisites: EXNS 6208 and PUBH 6619.

**PUBH 6631. Experiential Outreach in Community Chronic Disease Prevention. 2 Credits.**
Applied, experiential course focused on evidence-based strategies for preventing chronic diseases through community engagement, health promotion, and program evaluation. Prerequisites: PUBH 6007.

**PUBH 6640. Current Issues in Food Safety. 1 Credit.**
Current and emerging topics in food safety and interdisciplinary perspectives that inform the understanding of these issues. Can be repeated for credit provided the topic differs. Prerequisites: One of the following: PUBH 6612; or one year of work experience in the field of food safety and/or public health; or the permission of the instructor.

**PUBH 6699. Topics in Nutrition Sciences. 3 Credits.**
Examination of a particular facet of nutrition sciences. Topics vary by semester. May be repeated for credit provided topic differs. See the Schedule of Classes for more details.

**PUBH 6703. Healthcare Delivery and Health IT. 2 Credits.**
The rapidly changing structure of healthcare delivery in the United States as it has transformed to include virtual healthcare. Addresses the evolution of healthcare access and delivery, payment systems, coverage, regulations, and data. Prerequisites: HSML 6202 or PUBH 6012.

**PUBH 6704. Health Information Technology, Informatics, and Decision Making. 3 Credits.**
Operationalizing fundamental technology, processes, policies and concepts of healthcare informatics and decision management to translate data into actionable information within the framework of improving quality, safety, productivity, and experience.

**PUBH 6705. Health Law and Health IT. 3 Credits.**
The relationship between the federal legal system, healthcare system in the United States, and health IT. Roles of federal, state, and private stakeholders.

**PUBH 6706. Population and Community Health Analytics. 3 Credits.**
Overview of the concepts of population and community health, the informatics and analytics necessary to assess population health, and best approaches for decision makers and policy makers using and communicating population and community health data.

**PUBH 6714. Design of Technologies for Health and Healthcare Settings. 2 Credits.**
User-centered design, human factors, and their use in the creation/implementation of health sector technologies. The design cycle, user experience, accessibility, social and behavioral considerations, learning and performance support. Prerequisites: PUBH 6007.

**PUBH 6717. Predictive Analytics. 3 Credits.**
Introduction to the principal methods of predictive analytics, including the evaluation of predictive performance, and showing how these methods are applied in the delivery of health services in the United States. Prerequisites: PUBH 6002.

**PUBH 6730. Health Systems and Health IT Applied Analysis Immersion. 2 Credits.**
Immersion course in which students learn from national experts about how individual aspects of health IT fit together to address issues and potential opportunities in healthcare administrative and service delivery.

**PUBH 6850. Introduction to SAS for Public Health Research. 1 Credit.**
Conducting basic data management tasks with SAS software; creating libraries, data sets, and variables, and generating basic descriptive statistics and simple graphics of public health and biomedical data.

**PUBH 6851. Introduction to R for Public Health Research. 1 Credit.**
Read, clean, transform, tidy, and summarize public health data in R. Explore data and write R functions to make workflow more efficient.

**PUBH 6852. Introduction to Python for Public Health Research. 1 Credit.**
Introduction to the basic concepts of Python programming language, illustrated with applications in biomedical sciences and health informatics.

**PUBH 6853. Use of SAS for Data Management and Analysis. 3 Credits.**
Data management and analysis with SAS. Creating and manipulating variables, merging and concatenating data sets, implementing common statistical methods such as Student's t-test, linear regression, logistic regression. Prerequisites: PUBH 6002.

**PUBH 6854. Applied Computing in Health Data Science. 3 Credits.**
Concepts of computing in biomedical sciences and health informatics. Foundations of Unix shell, command line tools, R and Python programming languages, and their applications in public health. PUBH 6860 may be taken simultaneously. Prerequisites: PUBH 6860. Credit cannot be earned for this course and PUBH 4201.

**PUBH 6856. Advanced SAS for Public Health Research. 1 Credit.**
Advanced SAS programming. Interactive Matrix Language, SAS macro facility, Structured Query Language, and SAS/GRAPH options for creating drill-down graphs to analyze public health data sets. Prerequisites: PUBH 6002; and PUBH 6249 or PUBH 6853; or permission of the instructor.

**PUBH 6859. High Performance and Cloud Computing. 3 Credits.**
Introduction to high performance computing and cloud computing, including issues such as data transfer, security, virtual machines, and containers. HPC at GW, Amazon Web Services, and Google Cloud for biohealth computing. Prerequisites: PUBH 6851 and PUBH 6852 or permission of the instructor.

**PUBH 6860. Principles of Bioinformatics. 3 Credits.**
Biological concepts of molecular biology, genome organization, and evolution; computational concepts of alignment, database searching, phylogeny, and structure; and basic programming concepts including the shell, scripting, and databases. Restricted to graduate students. Recommended background: Basic knowledge of biology (BISC 1112 or equivalent) and an introductory course in statistics or biostatistics (STAT 1127 or equivalent) are assumed.

**PUBH 6861. Public Health Genomics. 3 Credits.**
Molecular technology and its impact on public health practice and discourse in the post-genomic era. The use of genomics to solve or help alleviate public health challenges. Prerequisites: Graduate student standing or permission with an introductory statistics course.

**PUBH 6862. Applied Linear Regression Analysis for Public Health Research. 3 Credits.**
Review of basic statistical inference and an overview of the construction of linear regression models for application to public health and biomedical data sets. Prerequisites: Prior completion of a course in undergraduate statistics and one semester of calculus.

**PUBH 6863. Applied Meta-Analysis. 1 Credit.**
Examination of meta-analysis (MA) with case studies using R. Statistical methods, including fixed- and random-effects MA; MA for binary and continuous data; heterogeneity in MA; meta-regression; and publication bias. Recommended background: Prior completion of an introductory course in biostatistical methods, such as PUBH 6002 or PUBH 6003, or an equivalent, is strongly recommended.

**PUBH 6864. Applied Survival Analysis for Public Health Research. 3 Credits.**
Application of survival or time-to-event data in public health studies. Censoring, survival functions, Kaplan-Meier curves, log-rank tests, Cox proportional hazards regression, parametric survival models, recurrent events, and competing risks Prerequisites: PUBH 6249 or PUBH 6853. Recommended background: undergraduate calculus.

**PUBH 6865. Applied Categorical Data Analysis for Public Health Research. 3 Credits.**
Comprehensive overview of methods for analyzing binary and multicategory response data. Contingency table methods for assessing associations and logistic regression for binary, nominal, and ordinal outcomes, including models for matched data. Prerequisites: PUBH 6002 and PUBH 6003.

**PUBH 6866. Principles of Clinical Trials. 3 Credits.**
Introduction to basic principles for design, conduct, analysis, and reporting of clinical trials. Developing a proposal for a clinical trial. Prerequisites: PUBH 6002 or equivalent.

**PUBH 6867. Health Data Visualization. 3 Credits.**
Introduction to health data visualization techniques and approaches to illustrate data for pattern discovery and storytelling in scientific fields, such as health and biomedical. Examples from real-world applications with large-scale data are used. Recommended background: basic R programming is recommended but not required.

**PUBH 6868. Quantitative Methods. 3 Credits.**
Basic mathematical statistics: probability, fundamental distributions including binomial, Poisson and normal, central limit theorem, consistency, basic point estimation, hypothesis testing, linear models, and maximum likelihood estimation. Prerequisites: PUBH 6002 and prior completion of at least two courses in single variable calculus. Corequisites: PUBH 6249 or PUBH 6853.

**PUBH 6869. Principles of Biostatistical Consulting. 1 Credit.**
Principles and practice of biostatistical consulting and related skills and knowledge for public health and medical research environments. Recommended background: Prior completion of at least two graduate-level courses in statistics and an introductory course that discusses common health research designs, such as PUBH 6003, or their equivalent is strongly recommended.

**PUBH 6870. Advanced Survival Analysis Markov Multistate Models. 1 Credit.**
Introduces statistical methodology in the analysis of time-to-event data (Markov Multistate Models). Expands classic methods in introductory survival courses to complex data configurations. Examples from real-world applications with large-scale data Prerequisites: PUBH 6864 or STAT 6227.

**PUBH 6871. Advanced Survival Analysis Recurrent Events. 1 Credit.**
Introduces statistical methodology in the analysis of time-to-event data (recurrent events). Expands classic methods in introductory survival courses to complex data configurations. Examples from real-world applications with large-scale data. Prerequisites: PUBH 6864 or STAT 6227.

**PUBH 6872. Advanced Survival Analysis Competing Risks. 1 Credit.**
Introduces statistical methodology in the analysis of time-to-event data (competing risks). Expands classic methods in introductory survival courses to complex data configurations. Examples from real-world applications with large-scale data. Prerequisites: PUBH 6864 or STAT 6227.

**PUBH 6883. Biostatistics Practicum. 0 Credits.**
Planned, supervised, and evaluated research activities for the MS Biostatistics program that involves the use of health data. Research activities may consist either of a primary research project or secondary analysis of an existing database. Restricted to students in the MS in biostatistics program. Prerequisites: PUBH 6862, PUBH 6865, PUBH 6867, completion of at least 15 credits towards the MS Biostatistics degree.

**PUBH 6884. Bioinformatics Algorithms and Data Structures. 3 Credits.**
Algorithmic foundations of bioinformatics, ranging from generic algorithmic techniques to specific algorithms used in various areas of bioinformatics. Theoretical background is complemented with solving practical problems. Prerequisites: PUBH 6854 or equivalent. Credit cannot be earned for this course and PUBH 4202.

**PUBH 6886. Statistical and Machine Learning for Public Health Research. 3 Credits.**
Application and evaluation of supervised and unsupervised statistical and machine learning algorithms in the context of biomedical and public health research. Permission of the instructor is required prior to enrollment.

**PUBH 6887. Applied Longitudinal Data Analysis for Public Health Research. 3 Credits.**
Introduction to commonly used methods for longitudinal data analysis including fixed effects models, linear and generalized linear mixed effects models, and generalized estimating equations. Missing data. Prerequisites: PUBH 6862 and PUBH 6965; and PUBH 6868, or PUBH 8364, or STAT 6201 and STAT 6202.

**PUBH 6888. Neural Networks with Applications in Biomedical Research. 3 Credits.**
Introduces deep learning methods including the construction and fitting of neural networks, various estimation and optimization methods, and unsupervised learning and ethical issues in artificial intelligence (AI). Recommended background: Students are expected to understand statistical models, probability and distribution theory, and be familiar with at least one programming language.

**PUBH 6894. Research Analytics. 3 Credits.**
Key concepts in research analytics; skills and experiences needed to leverage big data to improve public health through data integration.

**PUBH 6897. Research in Biostatistics and Bioinformatics. 1-4 Credits.**
Independent research. Must be approved in advance by advisor/instructor. Restricted to graduate students in the Department of Biostatistics and Bioinformatics.

**PUBH 6898. Master of Science Thesis. 1-3 Credits.**
Master's thesis.

**PUBH 6899. Topics in Biostatistics and Bioinformatics. 3 Credits.**
Topics vary by semester. May be repeated for credit provided the topic differs. Consult the Schedule of Classes for more details.

**PUBH 6999. Master of Science in Epidemiology Thesis. 2 Credits.**
Thesis research. Restricted to students in the MS in epidemiology program.

**PUBH 8001. Doctor of Philosophy Seminar on Cross-Cutting Concepts in Public Health. 1 Credit.**
Interactive seminar for PhD students covering analytic approaches, systematic thinking, and current issues within public health. Restricted to currently enrolled PhD students in the School of Public Health.

**PUBH 8010. Doctoral Independent Study. 1-3 Credits.**
Doctoral students complete an independent study plan to meet predetermined project and/or research work under the supervision of a faculty member. May be repeated for a maximum of 12 credits. Restricted to doctoral students in GWSPH programs.

**PUBH 8099. Doctoral Topics. 1-3 Credits.**
Topics vary by semester. May be repeated for credit provided the topic differs. Consult the Schedule of Classes for more details.

**PUBH 8110. Research Rotations. 2 Credits.**
Students conduct formal rotations with a laboratory or research group to gain research and reporting experience with the mentorship of EOH faculty. Includes identification of an environmental health research problem, collection or analysis of data, and reporting on the results. May be repeated for credit. Restricted to students in the PhD in environmental program or with the permission of the instructor.

**PUBH 8116. Communicating Research Results. 2 Credits.**
The importance of strategic communication to public health progress. Students gain communication skills that help to transcend educational barriers and facilitate connections with peers, policymakers, and the broader public. Restricted to doctoral students who have satisfactorily completed the comprehensive examination or with the permission of the dissertation chair.

**PUBH 8123. Applied Toxicology for Public Health. 3 Credits.**
How chemicals interact with biological systems to produce adverse effects; methods of development of toxicologic information and application to public health decision making. Understanding and characterizing sources of uncertainty in applications.

**PUBH 8126. Assessment and Control of Environmental Hazards. 3 Credits.**
The anticipation, recognition, assessment, and control of hazards in the workplace and the ambient environment. Emphasizes an understanding of the characteristic features of specific hazards, which may be chemical, biological, or physical/ergonomic.

**PUBH 8144. Computational and Systems Modeling. 2 Credits.**
Introduction to methodologies and concepts for understanding and developing deterministic and probabilistic models in environmental health sciences. Restricted to doctoral students. Prerequisites: PUBH 6862.

**PUBH 8199. Topics in Environmental and Occupational Health. 3 Credits.**
Topics vary by semester. May be repeated for credit provided the topic differs. Consult the Schedule of Classes for more details.

**PUBH 8210. Professional Skills Enhancement for Doctoral Students in Epidemiology. 0 Credits.**
Provides doctoral students in epidemiology the opportunity to further develop their professional skills as they prepare to engage in the public health workforce as doctoral-level epidemiologists. Restricted to Students in the PhD in epidemiology program who have completed the comprehensive exam. Prerequisites: completion of the comprehensive examination.

**PUBH 8242. Advanced Topics in Clinical Epidemiology and Public Health: Reading the Research. 1 Credit.**
Evidence-based problem-solving approach using methods covered in PUBH 6242. Restricted to doctoral students. Prerequisites: PUBH 6003 or equivalent. Corequisites: PUBH 6242. Credit cannot be earned for this course and PUBH 6243.

**PUBH 8244. Doctoral Topics: Cancer Epidemiology. 1 Credit.**
Course focuses on critical review and interpretation of cancer epidemiology literature as well as issues in research design in the field. Prerequisites: PUBH 6001 and PUBH 6003. Corequisites: PUBH 6244.

**PUBH 8245. Doctoral Topics: Infectious Disease Epidemiology. 1 Credit.**
Provides doctoral level material on the content of infectious disease epidemiology. The course focuses on critical review and interpretation of infectious disease literature as well as issues preparing an analytic research paper on an emerging infectious disease and the application of tools used to describe the epidemiology of those diseases. Spring Prerequisites: PUBH 6003. Corequisites: PUBH 6245.

**PUBH 8250. Doctoral Topics: Epidemiology of HIV/AIDS. 1 Credit.**
Students select specific topic within area of HIV/AIDS epidemiology. Options include responding to a data analysis problem; responding to a methodological problem found within HIV/AIDS research; or another topic approved by instructor. Prerequisites: PUBH 6001 and PUBH 6003. Corequisites: PUBH 6250.

**PUBH 8259. Doctoral Topics: Epidemiologic Surveillance in Public Health. 1 Credit.**
Course provides doctoral level material on the content of surveillance offered in PUBH 6259. Focus is on critical review and interpretation of surveillance literature as well as issues preparing an analytic research paper. Prerequisites: PUBH 6002 and PUBH 6003. Corequisites: PUBH 6259.

**PUBH 8283. Doctoral Biostatistics Consulting Practicum. 2 Credits.**
Students work under supervision to develop an experience-based understanding of how biostatistical skills are used in one or more areas of health research. Restricted to doctoral students. Prerequisites: Completion of at least 6 credits in any combination of general or specialized graduate-level statistics courses, such as PUBH 6202, PUBH 6260, STAT 6201, or STAT 6202.

**PUBH 8364. Quantitative Methods. 3 Credits.**
Introduces basic concepts in mathematical statistics. Topics include probabilities (unconditional and conditional), density and distribution functions of continuous and discrete random variables, including expected values. Specific distribution functions discussed are Binomial, Poisson, Hypergeometric, and Gaussian distributions. Additional topics include bivariable distributions, variance-covariance matrix, limiting theory, asymptotic results, and maximum likelihood estimation. Prerequisites: MATH 1231 and MATH 1232; and PUBH 6002 and PUBH 6249.

**PUBH 8366. Biostatistical Methods. 3 Credits.**
Biostatistical methods for asymptotically efficient tests and estimates of relative risks and odds ratios from prospective and retrospective matched and unmatched studies. Fixed and random effects models. Logistic regression, conditional logistic regression. Poisson regression. Maximum likelihood and efficient scores. Prerequisites: STAT 6202 or permission of the instructor.

**PUBH 8404. Advanced Topics: Health Systems and Health Policy Research. 3 Credits.**
Examination and assessment of issues related to the intersection of health care systems and health policy, and how health policy and health services research can inform the development and evaluation of health care systems and health policy. Restricted to doctoral candidates. Prerequisite: PUBH 6315.

**PUBH 8405. Advanced Topics: Health Economics Research. 3 Credits.**
Critical financing issues for U.S. public health and health care services and systems. The role of health services research in understanding the effects of these issues and informing the deliberations and decisions of policymakers.

**PUBH 8406. Advanced Topics in Global Health Doctoral Seminar I. 3 Credits.**
Advanced introduction to multidisciplinary research and contemporary debates in global health. Topics include the fields of global population health; health policy and systems research; and infectious disease control. Restricted to students in the DrPH and PhD programs.

**PUBH 8407. Advanced Topics in Global Health Doctoral Seminar II. 2 Credits.**
Second in a two course sequence that provides doctoral students with an in-depth, substantive understanding of advanced research and practice-related challenges in global health. Restricted to students in the DrPH and PhD programs. Prerequisites: PUBH 8406.

**PUBH 8408. Advanced Topics: Health Behavior Research & Practice Applications. 3 Credits.**
Advanced topics relating theory to practice in areas of health education and behavioral change. Application of qualitative and quantitative research to health related behavior at individual and community levels.

**PUBH 8409. Advanced Topics: Health Communication Research. 3 Credits.**
Methods of communications research designed to alter health behavior. Emphasis on critical analysis of communications research aimed at the mass public, groups, and interpersonal level.

**PUBH 8411. Advanced Topics: Principles of Human Health Risk Science. 3 Credits.**
This course provides the doctoral student with a comprehensive orientation to the frameworks, principles and issues involved in assessing, managing and communicating environmental health risks. This fundamental, interdisciplinary course is designed to foster dialogue and insights about contemporary risk science and management issues, including ethical concerns and technical issues that influence policy making. Restricted to students in the environmental and occupational health program, or with permission of the instructor.

**PUBH 8412. Advanced Topics: Environmental and Occupational Health Research and Practice. 3 Credits.**
This course exposes students to the theory and reality of both research and practice in environmental and occupational health. There is an emphasis on the use of public health science in policy and regulatory decisions. Prerequisites: PUBH 8411 or permission of the instructor.

**PUBH 8413. Research Leadership. 1-10 Credits.**
Students participate in a range of activities designed to develop and enhance their research methods and analytic skills. These activities include participating in the development and submission of sponsored research proposals; being formally affiliated with a research project, assuming responsibility for completing a real-world research project; engaging in empirical data collection and analysis efforts.

**PUBH 8414. Policy and Management Leadership. 1-10 Credits.**
Students develop and enhance their management, leadership, and policymaking skills for problem solving in real-world settings; public health departments, community health centers, legislative settings, and public or teaching hospitals.

**PUBH 8415. Instructional Leadership. 1-10 Credits.**
Students participate in a range of activities designed to develop and enhance their teaching skills. These activities include course development, teaching master's level courses, acting as TA for undergraduate courses, advising students about their class performance, evaluating student performance, and developing remedial programs for students.

**PUBH 8416. Study Design and Evaluation Methods. 3 Credits.**
Prepares doctoral students to design and conduct program and policy evaluation in public health.

**PUBH 8417. Qualitative Research Methods and Analysis. 3 Credits.**
Techniques for designing and conducting qualitative research and for analyzing and reporting qualitative data relevant to program development and implementation, community assessment, and policy analysis. Prerequisites: PUBH 8416.

**PUBH 8418. Applied Statistical Analysis. 3 Credits.**
Intensive course in data management and data analysis using STATA® . Database management system techniques and data analytical strategies for the appropriate analysis of data sets obtained from a variety of studies will presented. The student will manipulate national data sets from epidemiological studies as well as Demographic and Health Survey (DHS) data. Prereq: PubH 8416.

**PUBH 8419. Measurement in Public Health and Health Services. 3 Credits.**
Review principles of measurement and assessment as they apply to public health and health services research constructs, review existing state-of-the-art measures of individual and population health status (e.g., morbidity, mortality, functioning and health-related quality of life) and of individual and community health behavior. Explore current measurement issues in health research.

**PUBH 8420. Advanced Analysis and Dissemination. 3 Credits.**
Advanced multivariate data analyses of complex datasets and programs, including advanced cross-sectional techniques, time-series analysis, and the use of panel data. Evaluation of results, and dissemination of findings to relevant stakeholders. Fall. Prerequisites: PUBH 8417 and PUBH 8418.

**PUBH 8422. Advanced Healthcare and Public Health Research Design. 2 Credits.**
Design of protocol suitable for implementation as part of the DrPH dissertation requirement. Permission of the instructor, completion of required coursework, and successful completion of the comprehensive examination required prior to enrollment.

**PUBH 8423. Dissertation Research. 1-12 Credits.**
Dissertation research for DrPH. Prerequisite: PUBH 8422.

**PUBH 8435. PhD Dissertation Proposal Development. 2 Credits.**
PhD students receive guidance in developing and defending their dissertation proposal. Restricted to doctoral students who have successfully completed comprehensive examinations.

**PUBH 8470. Global Health Demographic Methods. 3 Credits.**
Introduction to the derivation, application, and substantive importance of core demographic measures used in public health. Permission of the instructor is required prior to enrollment. Restricted to doctoral students.

**PUBH 8471. Ethics in Public Health Practice and Policy. 2 Credits.**
Basics of public health ethics and the process of ethical analysis. Tools and resources for addressing ethical challenges that commonly arise in the practice of public health.

**PUBH 8472. Survey Research Design. 3 Credits.**
Introduction to basic methodologies necessary to develop and field a scientific survey instrument, including sampling, question and questionnaire design, and administration. Restricted to doctoral students.

**PUBH 8473. Advanced Topics Global Child Health. 1 Credit.**
Topics and issues in global child health. Focus on critical review and interpretation of health challenges facing children in low- and middle- income countries. May be repeated provided the topic differs. Consult the Schedule of Classes for details. Restricted to doctoral students. Corequisites: PUBH 6563.

**PUBH 8474. Advanced Health Systems Research Methods in Low- and Middle-Income Countries. 1 Credit.**
Advanced methods for designing and executing health systems research in low- and middle-income countries. Critical review and interpretation of health systems research literature, case study designs, and qualitative data analysis. Restricted to doctoral students. Corequisites: PUBH 6474.

**PUBH 8475. Research Ethics and Integrity in Domestic and International Research. 1 Credit.**
Introduces ethical issues that arise in the conduct of research with human beings with the goal of increasing knowledge and skills to recognize and consider ethical issues that arise in the conduct of human subject research. Restricted to graduate students in the School of Public Health, School of Medicine and Health Sciences, and School of Nursing, or with the permission of instructor.

**PUBH 8476. Realist Evaluation in Health Policy and Systems. 1 Credit.**
Design, implementation, and methodological refinement of realist evaluations in complex health systems. Analysis of realist evaluation methodology. Application of realist approaches to interventions in low- and middle-income countries Restricted to doctoral students. Corequisites: PUBH 6476. Credit cannot be earned for this course and PUBH 8474.

**PUBH 8486. Global Infectious Diseases. 1 Credit.**
Advanced topics and current issues in the control, prevention, and global impact of infectious diseases, both emerging and re-emerging. Restricted to doctoral students.

**PUBH 8525. Advanced Topics in Social and Behavioral Sciences. 1 Credit.**
In-depth exploration of key concepts and theoretical orientations in the social and behavioral sciences with applications to public health. Restricted to students in the PhD in the social and behavioral sciences in public health program.

**PUBH 8526. Application of Structural Equation Modeling to Public Health Research. 3 Credits.**
Structural equation modeling (SEM) and its application using Mplus statistical software. Includes basic concepts of SEM, mediation analysis, latent growth modeling, and latent class modeling. Restricted to doctoral students. Prerequisites: PUBH 6862 or PUBH 8418.

**PUBH 8527. Scientific Writing and Training Grant Development. 1 Credit.**
Prepares students to submit NIH training grant funding requests; includes identifying research gaps and training needs and practicing presentation skills. Restricted to doctoral students. Prerequisites: approval of the program director.

**PUBH 8528. Advanced Topics in Critical Review of Social-Behavioral Theory and its Application in Public Health. 3 Credits.**
Advanced topics relating social and behavioral theory to health behavior change interventions in areas of health promotion, education, an prevention programs. Restricted to doctoral students.

**PUBH 8534. Multi-Level Interventions for Health Promotion. 3 Credits.**
An in-depth investigation of the field of intervention science with specific applications to public health. Restricted to doctoral students.

**PUBH 8610. Statistical Methods for Health Policy. 3 Credits.**
Application of statistical analysis in health policy and public health research using Stata® to analyze a variety of large public health data sets. Prior completion of at least one graduate-level statistics course is required. Restricted to doctoral students. Credit cannot be earned for this course and PUBH 6310.

**PUBH 8620. Seminar: Foundations of U.S. Health Policy. 2 Credits.**
Reintroduction to the basics of U.S. health policy, combining advanced legal, policy, and regulatory content with advanced health law and policy analysis skills. Restricted to doctoral students in health policy or with the permission of the instructor.

**PUBH 8622. Healthcare Payments, Systems, and Delivery Models. 3 Credits.**
Survey of long-standing practices and recent developments in provider payment and the organization of healthcare delivery in the United States. Restricted to doctoral students in the health policy program or with the permission of the instructor.

**PUBH 8700. DrPH Seminar and Introduction to DrPH Applied Practice Experience (DAPEx). 3 Credits.**
Interactive seminar providing doctor of public health students with a fundamental understanding of the history and current issues associated with health policy, health behavior, global health, and environmental and occupational health. Restricted to students in the doctor of public health program.

**PUBH 8701. Doctor of Public Health Applied Practice Experience. 0 Credits.**
Application of principles of leadership and management, and public health theories and methodologies, to real-life situations to demonstrate mastery of evidence-based public health decision making and strong leadership skills in practice. Restricted to students in the doctor of public health program.

**PUBH 8702. Doctor of Public Health Proposal Development. 2 Credits.**
Students receive support, guidance, and critique as they develop their draft applied dissertation proposal and prepare for the oral presentation to defend the proposal. Each student must meet with the instructor before the term begins. Restricted to students in the DrPH program with permission of the instruction. Prerequisites: Successful completion of the comprehensive examination and a research hypothesis and abstract approved by the academic advisor or dissertation chair.

**PUBH 8703. Dissertation Portfolio Independent Study I for DAPEx and Dissertation Proposal Development. 1 Credit.**
Opportunity to narrow and refine a public health problem and approach that will be pursued for the doctor of public health applied practice experience and dissertation. Restricted to students in the doctor of public health program. Prerequisites: PUBH 8700.

**PUBH 8704. Applied Dissertation. 2 Credits.**
Development and defense of the doctor of public health dissertation. Restricted to students in the doctor of public health program.

**PUBH 8705. Dissertation Portfolio: Independent Study II for DAPEx and Dissertation Proposal Development. 1 Credit.**
Continued refinement of identified public health problem and approach students pursue for their doctor of public health applied practice experience and dissertation. Restricted to students in the doctor of public health program. Prerequisites: PUBH 8703.

**PUBH 8706. Leadership Principles and Practice I. 3 Credits.**
Course modules covering personal leadership; leadership models, theories, concepts, tools, and skills; and practical application of leadership to real world situations. Restricted to students in the doctor of public health program.

**PUBH 8707. Dissertation Portfolio: Dissertation Proposal Development. 3 Credits.**
Planning the development and defense of the dissertation proposal. Restricted to students in the doctor of public health program.

**PUBH 8708. Applied Public Health Methods I. 3 Credits.**
Framework of critical analysis and application of key public health methodologies; qualitative, quantitative, policy analysis, mixed methods, implementation science, to interpret and communicate findings to address global public health issues. Restricted to doctoral students. Credit cannot be earned for this course and PUBH 8732.

**PUBH 8709. Dissertation Portfolio: Dissertation Proposal Defense. 2-3 Credits.**
Preparation for the dissertation proposal defense. Requires close work with the dissertation committee. Builds upon the work conducted in PUBH 8707. Restricted to students in the doctor of public health program. Prerequisites: PUBH 8707.

**PUBH 8710. Public Health Project Management and Social Entrepreneurship. 3 Credits.**
Depth of study in the competencies necessary for creating social enterprises to foster public health innovation and managing enterprises, people, and projects.

**PUBH 8711. Dissertation Portfolio: DAPEx and Dissertation Implementation. 1-2 Credits.**
Opportunity to apply principles of leadership and management and public health theories and methodologies learned through the program coursework to real-life public health challenges and approaches. Restricted to students in the doctor of public health program.

**PUBH 8712. Public Health Program Planning, Implementation, and Evaluation. 3 Credits.**
Planning models for population health problems; strategies for assessing and improving equity in health programs; implementation and evaluation models; stakeholder engagement; ethics in planning and evaluation; gathering data for evaluations. Restricted to doctoral students. Credit cannot be earned for this course and PUBH 8731.

**PUBH 8713. Dissertation Portfolio: Dissertation Development. 1-2 Credits.**
Culminating experience of the DrPH. Following dissertation proposal defense, students work with their dissertation committee members and Applied Practice Experience (DAPEx) site preceptor to contextualize their DAPEx as their dissertation. Restricted to students in the doctor of public health program. Prerequisites: PUBH 8711.

**PUBH 8714. Leadership Principles and Practice II. 3 Credits.**
Essential tools in public health leadership with a focus on effective decision-making skills to solve complex health problems and implement successful solutions to improve population health.

**PUBH 8715. Dissertation Portfolio: Dissertation Defense. 2 Credits.**
Defense of the dissertation. Requires multiple rounds of review of the entire dissertation with the dissertation committee to prepare for the defense. Restricted to students in the doctor of public health program. Prerequisites: PUBH 8713.

**PUBH 8716. Education and Workforce Development Approaches for Public Health Leaders. 3 Credits.**
Foundational knowledge of learning theories for public health leaders to be effective educators in academic, community, and practice settings. Practical leadership skills for workforce development including effective mentoring and coaching. Restricted to doctoral students.

**PUBH 8718. Public Health Communications and Marketing. 3 Credits.**
Explores the historical, ecological, and cultural factors that influence communication about health and the outcomes of health communication. Explores the social, interpersonal, and intrapersonal factors that influence health outcomes.

**PUBH 8720. Social Change and Collective Impact. 3 Credits.**
Apply a health equity lens and equip professionals with the skills to analyze and address complex social determinants of health, design and implement community-based interventions, and lead collective change initiatives. Restricted to doctoral students. Prerequisites: PUBH 8722.

**PUBH 8722. Public Health Policy Analysis. 3 Credits.**
Develops advanced analytic and problem-solving skills for health policy development and program analysis and communication skills for health policy dissemination to decision makers and the public. Restricted to doctoral students.

**PUBH 8724. Organizational Leadership and Change Management. 3 Credits.**
Skill development for change agents in public health organizations. Practical frameworks and applied theories of organizational change management needed for leading change management efforts and equity-centered organizational outcomes.

**PUBH 8726. Applied Public Health Methods II. 3 Credits.**
Principles and practices of public health surveillance studies. Design and conduct randomized controlled trials, quasi-experimental designs, cost-effectiveness analysis, and dissemination and implementation science Restricted to doctoral students. Prerequisites: PUBH 8708. Credit cannot be earned for this course and PUBH 8733.

**PUBH 8730. Doctor of Public Health Immersion. 2 Credits.**
Overview of the doctor of public health program, focusing on competencies, courses, and dissertation portfolio. Doctoral students uncover their leadership styles and practice highly effective leadership skills. Restricted to students in the doctor of public health program.

**PUBH 8731. Applied Public Health Methods I: Program Planning, Implementation and Evaluation. 3 Credits.**
Planning models for population health problems; strategies for assessing and improving equity in health programs; implementation and evaluation models; stakeholder engagement; ethics in planning and evaluation; gathering data for evaluations Restricted to doctoral students. Credit cannot be earned for this course and PUBH 8712.

**PUBH 8732. Applied Public Health Methods II: Mixed Methods. 3 Credits.**
Framework of critical analysis and application of key public health methodologies; qualitative, quantitative, policy analysis, mixed methods, implementation science, to interpret and communicate findings to address global public health issues. Restricted to doctoral students. Credit cannot be earned for this course and PUBH 8708.

**PUBH 8733. Applied Public Health Methods III: Evidence for Decision Making. 3 Credits.**
Principles and practices of public health surveillance studies; Design and conduct randomized controlled trials, quasi-experimental designs, cost-effectiveness analysis, and dissemination and implementation science Restricted to doctoral students. Prerequisites: PUBH 8732. Credit cannot be earned for this course and PUBH 8726.

**PUBH 8799. Doctor of Public Health Topics. 3 Credits.**
Topics vary by semester. May be repeated for credit provided the topic differs. Consult the Schedule of Classes for more details.

**PUBH 8870. Statistical Inference for Public Health Research I. 3 Credits.**
First of two courses teaching non-measure theory based statistical inference sequences. Prerequisites: MATH 2184 and MATH 2233 or permission by instructor.

**PUBH 8871. Statistical Inference for Public Health Research II. 3 Credits.**
Second of two courses teaching non-measure theory based statistical inference sequences. Prerequisites: PUBH 8870.

**PUBH 8875. Linear Models in Biostatistics. 3 Credits.**
Introduction to the theory of linear models with applications to public health and biomedical data. Least squares, maximum likelihood, and distribution theory for linear regression. Prerequisites: PUBH 6862; and PUBH 6868 or PUBH 8364 or STAT 6201. Corequisites: STAT 6202. Recommended background: prior completion of coursework in linear algebra and multivariable calculus.

**PUBH 8877. Generalized Linear Models in Biostatistics. 3 Credits.**
Theoretical development of most commonly used methods for categorical and count data presented within the unified framework of the generalized linear model. Prerequisites: PUBH 6865; and PUBH 6868, or PUBH 8364, or STAT 6201 and STAT 6202. Recommended background: prior completion of coursework in linear algebra.

**PUBH 8878. Statistical Genetics. 3 Credits.**
Application of statistical concepts to family- and population-based genetic data. Human evolution, genome-wide association studies, gene-environment interactions, and genetic architecture with emphasis on applications to real data and analyses. Prerequisites: PUBH 6860.

**PUBH 8879. An Introduction to Causal Inference for Public Health Research. 3 Credits.**
Introduces causal inference concepts for both randomized and observational studies; contrast causation versus association; and conduct causal inference using statistical software with clinical data. Prerequisites: Courses in statistical inference at the level of PUBH 6868, logistic regression at the level of PUBH 6865, and introduction to R at the level of PUBH 6851; or with the permission of the instructor.

**PUBH 8880. Statistical Computing for Public Health Research. 3 Credits.**
Introduction to high-level computational tools for complex statistical problems with applications to public health and biomedical research. Prerequisites: PUBH 8870 and PUBH 8871. Recommended background: basic programming skills using a computer language such as R or C.

**PUBH 8885. Computational Biology. 3 Credits.**
Introduction to modern computational biology, including omics data science, high-throughput technologies, multi-omics data integration, and analytical methods with real world applications. Permission of the instructor is required prior to enrollment. Recommended background: Basic knowledge of biology and programming, eg R and Python.

**PUBH 8888. Advanced Topics in Clinical Trials. 2 Credits.**
Varying topics in the design, monitoring, analysis, interpretation, and reporting of modern clinical trials. Class sessions consist of presentations from the instructors and students and class discussion of presentations and readings. Prerequisites: PUBH 6866 or equivalent. Recommended background: A basic knowledge of design, conduct, and analysis and reporting of clinical trials is assumed.

**PUBH 8890. Research and Teaching Orientation. 1 Credit.**
Develop skills and experience in scientific research of health data science, including literature searches and organization, grant writing, internship development, manuscript writing, professional networking, and professional research presentations. Restricted to graduate students.

**PUBH 8891. Internship in Data Science. 1-3 Credits.**
Develop skills and experience in scientific research, especially around health data science, through off-campus research experiences at other universities, research institutes, government agencies, nongovernmental organizations, and industry. Restricted to graduate students with the permission of the instructor or advisor.

**PUBH 8899. Topics in Biostatistics and Bioinformatics. 3 Credits.**
Topics vary by semester. May be repeated for credit provided the topic differs. Consult the Schedule of Classes for more details.

**PUBH 8999. Dissertation Research. 1-12 Credits.**
Dissertation research.