Department of Epidemiology and Environmental Health Sciences

The Department of Epidemiology and Environmental Health Sciences at Georgia Southern University's Jiann-Ping Hsu College of Public Health is designed to prepare you to become an applied epidemiologist in Public Health and/or a public health worker who is able to recognize the public health implications of environmental and occupational factors. As a student concentrating in epidemiology, you will study diseases of the human body in order to determine occurrence, distribution, and causative factors of diseases in human populations. As a student concentrating in environmental health sciences, you will gain an understanding of the factors responsible for influencing mortality and morbidity trends in human populations.

Doctoral Degrees

- Public Health Dr.P.H. (Concentration in Epidemiology) (http://catalog.georgiasouthern.edu/graduate/jiann-ping-hsu-public-health/epidemiology-environmental-health-sciences/epidemiology-drph)

Masters Degrees

- Public Health M.P.H. (Concentration in Epidemiology) (http://catalog.georgiasouthern.edu/graduate/jiann-ping-hsu-public-health/epidemiology-environmental-health-sciences/epidemiology-mph)
- Public Health M.P.H. (Concentration in Environmental Health Sciences) (http://catalog.georgiasouthern.edu/graduate/jiann-ping-hsu-public-health/epidemiology-environmental-health-sciences/environmental-health-sciences-mph)

ENVH 7090 Selected Topics in Environmental Health Sciences
1-3 Credit Hours. 1-3 Lecture Hours. 0 Lab Hours.
Allows the student the opportunity to receive specialized and/or focused instruction in an environmental health topic not generally offered by the department.

ENVH 7231 Air Quality
3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.
Introduces students to chemical, physical, and biological principles of air quality, as well as potential sources of contamination and the resulting effects. The course will also introduce environmental policies pertinent to air issues along with current remediation strategies to ameliorate pollution.
Prerequisite(s): A minimum grade of "C" in PUBH 6532.

ENVH 7232 Water Quality
3 Credit Hours. 2 Lecture Hours. 2 Lab Hours.
Introduces students to chemical, physical, and biological principles of water quality, as well as potential sources of contamination and the resulting effects. The course will also introduce environmental policies pertinent to water issues along with current treatment and remediation strategies to ameliorate pollution.
Prerequisite(s): A minimum grade of "C" in PUBH 6532.

ENVH 7233 Environmental Exposure and Impact Assessment
3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.
This course introduces students to appropriate design, implementation, and analysis of primary environmental exposures. Specific topics covered include designing risk profiles, analyzing field exposures of toxins, development of impact assessments, and evaluating dose-response relationships.
Prerequisite(s): A minimum grade of "C" in PUBH 6533 and ENVH 7231 or ENVH 7232.

ENVH 7234 Environmental Toxicology
3 Credit Hours. 3 Lecture Hours. 1 Lab Hour.
This course introduces students to concepts associated with the lethal and sub-lethal effects of environmental and occupational stressors on humans and other living organisms. The course also includes laboratory experiments designed to enhance comprehension, among students, in the area of toxicology.
Prerequisite(s): A minimum grade of "C" in PUBH 6532.

ENVH 7235 Field Methods in Environmental Health
3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.
This course introduces students to an overview of current and accepted standards of environmental and occupational exposure monitoring. Also examines the field methodology related to sample collection for water and air quality monitoring.

ENVH 7236 Spatial Analysis for Environmental Health Sciences
3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.
Introduces students to concepts and methods of spatial analysis related to environmental health problems and public health planning. Students will also employ basic concepts of mapping through the use of applicable Geographic Information Systems software.

ENVH 7237 Risk Assessment and Communication
3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.
Introduces students to the qualitative and quantitative skills necessary to evaluate the probability of injury, disease, or death in the general population from exposure to environmental contaminants. Hazard identification, exposure assessment, dose-response evaluation, and risk characterization are highlighted. Risk communication includes developing practical skills in assessing health concerns and explaining potential health risks or risk management to the general public.
Prerequisite(s): A minimum grade of "C" in ENVH 7233.

ENVH 7238 Environment, Ethics and Equity
3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.
Introduces students to theory, concepts and methods of ethics and equity related to one's location. Topics to be addressed include environmental justice, public health ethics, impacts on equity and disparities. Students will also employ basic concepts of spatial analysis through the use of applicable Geographic Information Systems (GIS) software.

ENVH 7239 Public Health Laboratory
3 Credit Hours. 0 Lecture Hours. 6 Lab Hours.
This course introduces students to the laboratory practices and skills necessary to sample, archive, transport, process and analyze environmental materials. Experiences include the design of laboratory experiments including the applications of contemporary laboratory microbiological, cell culture and molecular and instrumental tools used for testing environmental specimens. Experiences will also include silico analysis of laboratory test results, writing technical reports and presenting the outcomes of the research.
Prerequisite(s): A minimum grade of "C" in PUBH 6532 and BIOS 6541 and ENVH 7231 and ENVH 7232 or permission of instructor.

ENVH 7890 Directed Individual Study
1-3 Credit Hours. 1-3 Lecture Hours. 0 Lab Hours.
Provides the student with an opportunity to investigate an area of interest under the direction of a faculty mentor.
ENHV 8335 Global Water Quality and Health: Principles and Research
3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.
The global water crisis is the most serious threat to human health. Poor water quality, lack of sanitation and inadequate access to clean water resources are one of the major causes of global health disparities. Current issues such as changing climate, decaying infrastructure and reemerging waterborne diseases are also contributors for disease transmission within vulnerable populations. This course analyzes the key drivers that affect global water quality and human health. Real world case scenarios will be examined to develop sustainable and appropriate solutions that consider environmental, individual, cultural, and economic factors.

ENHV 8435 Toxicology and Health
3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.
This course primarily deals with the sources, exposure, fate, transport, and effects (lethal and sub-lethal) of environmental and occupational stressors on humans and other living organisms of public health significance. Emphasis is placed on the effects of pollutants/contaminants from air, water, soil, and/or food on humans; and historically relevant incidents of environmental contaminants and impact on health. This course also introduces students to the concept of risk assessment, communication, and management of hazardous materials typically encountered in the environment and associated toxicological and public health implications. Importantly, this course also gives students the opportunity to explore intervention strategies against various chemical exposure scenarios and define schemes to prevent future contamination issues related to toxic substances.

Prerequisite(s): A minimum grade of "C" in PUBH 6532.

ENHV 9133 Vector-Borne and Zoonotic Diseases: Biology, Epidemiology, and Control
3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.
This course introduces students to important vector-borne and zoonotic diseases, including endemic and emerging zoonoses of historic and contemporary importance in the US and from a global perspective. It provides an overview of the epidemiology of major vector-borne diseases, the biology of their vectors and animal reservoir and their interaction with pathogens. It discusses the dynamics and principles of pathogen transmission, examines current approaches to vector and disease surveillance, and summarizes the public health challenges associated with control and prevention of these diseases and proper use of pesticides and other environmentally safe methods.

Prerequisite(s): A minimum grade of "C" in PUBH 6541 and PUBH 8133.

EPID 7090 Selected Topics in Epidemiology
1-3 Credit Hours. 1-3 Lecture Hours. 0 Lab Hours.
Allows the student the opportunity to receive specialized and/or focused instruction in an epidemiology topic not generally offered by the department.

EPID 7131 Epidemiology of Chronic Disease
3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.
This course is designed to introduce the student to the ever-expanding area of chronic disease epidemiology. Students will be introduced to the current status of chronic disease and control programs, methods used in chronic disease surveillance, intervention methods, and modifiable risk factors. Some of the major chronic diseases such as cancer, cardiovascular disease, chronic lung disease, diabetes and arthritis will be discussed in detail.

Prerequisite(s): A minimum grade of "B" in PUBH 6533.

EPID 7133 Epidemiologic Research Methods I
3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.
This course will focus on epidemiologic methods - primarily methods used in observational studies using existing data, cohort studies, case-control studies and randomized controlled trials. With respect to cohort studies, topics covered include cohort identification, ascertainment of exposure status, follow-up of cohort members, measuring outcomes, sources of bias and interpretational issues. Case-control topics include issues around defining cases and controls, control of confounding, and sources of bias/systematic error. Topics around randomized trials include randomization procedures, defining and assembling treatment/intervention arms, selecting study subjects and approaches to data collection. Other topics covered in this course include surveillance and ecologic studies. Pros and cons of all study designs will be discussed, in part through readings of published papers. Fundamentals of data analysis will also be addressed, but a detailed discussion of that material will be covered in EPID 7134.

Prerequisite(s): A minimum grade of "B" in BIOS 6541 or PUBH 6541.

EPID 7134 Epidemiologic Research Methods II
3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.
This course provides instruction and hands-on experience in the analysis and interpretation of data from epidemiologic studies. Topics to be covered include epidemiology research questions that can be addressed by case-control and cohort studies, the rationale underlying the major techniques used to analyze data from case-control and cohort studies, the conditions under which these methods are appropriate and their relative advantages and disadvantages. Attention will be given to how interactions, confounders and nonlinear relationships among variables can be addressed along with interpretation of statistical software output from epidemiologic studies employing these designs and analytical methods.

Prerequisite(s): A minimum grade of "B" in EPID 7133.

EPID 7135 Epidemiology of Infectious Disease
3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.
This course is designed to provide students with an overview of the principles and practices of infectious diseases epidemiology with focus on how the presence and control of communicable diseases effects public health locally, nationally and internationally. Topics to be covered include: 1) general principles of infectious diseases epidemiology, including outbreak investigation, surveillance, analysis of infectious diseases data, and laboratory testing of specimens; 2) major modes of infectious disease transmission, including airborne, food and water, zoonotic, insect vector, blood, and sexual transmission; 3) different control strategies for infectious diseases, including infection control, antimicrobial management, immunization, risk factor modification, and screening; 4) the practical application of epidemiologic tools for the understanding and control of infectious diseases.

Prerequisite(s): A minimum grade of "B" in PUBH 6533 and PUBH 6541 and BIOS 6541.

EPID 7230 Social Epidemiology and Health Equity
3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.
This course will focus on understanding the social determinants of health. The course will provide an analysis of major social variables that affect population health: poverty, social class, gender, race, family, community, work, behavioral risks, and coping resources. Readings and discussion center on understanding the theories, measurement and empirical evidence related to specific social conditions and experiences such as socioeconomic position, discrimination, social networks and support, work conditions, ecological level neighborhood and community social conditions, and social and economic policies. Biological and psychological mechanisms by which social conditions influence health will be discussed. Methods are introduced to operationalize each construct for the purposes of empirical application in epidemiologic research.

Prerequisite(s): A minimum grade of "B" in PUBH 6533.
EPID 7233  Public Health Surveillance
3 Credit Hours.  3 Lecture Hours.  0 Lab Hours.
This course will provide students with a strong foundation in public health surveillance of both health conditions and risk factors. The course will teach the theory and practice of surveillance supported by many examples of surveillance systems from the developed and developing world. The class will build on and reinforce basic epidemiologic concepts. Students will be given the opportunity to design and evaluate a surveillance system.
Prerequisite(s): A minimum grade of "B" in PUBH 6533.

EPID 7890  Directed Individual Study
1-3 Credit Hours.  1-3 Lecture Hours.  0 Lab Hours.
Provides the student with an opportunity to investigate an area of interest under the direction of a faculty mentor.

EPID 8130  Field Methods in Epidemiology
3 Credit Hours.  3 Lecture Hours.  0 Lab Hours.
This course addresses practical aspects of management and implementation of research studies and will focus on the conduct of research consistent with the scientific method. Topics include planning study activities, questionnaire design and implementation, and operations research.

EPID 8230  Observational Study Design and Analysis
3 Credit Hours.  3 Lecture Hours.  0 Lab Hours.
This course will focus on the design and conduct of observational research designs including cohort, case-control and cross-sectional approaches. This course will provide instruction related to issues specific to observational research approaches. Students will develop and present detailed study plans for each research approach.

EPID 8231  R for Epidemiologists
3 Credit Hours.  3 Lecture Hours.  0 Lab Hours.
This is an introductory course in R tailored to the needs of epidemiologists and epidemiological research. The course will include data management, mathematical and statistical computation and analytical statistical tools that epidemiologists can use in their research and practice.

EPID 8431  Stata for Epidemiologists
3 Credit Hours.  3 Lecture Hours.  0 Lab Hours.
This course emphasizes data management and software applications using the Stata software package. Student will learn how to use Stata codes for the basics of data-management, data-reporting, graphics and use of do-files. Students will also learn basic Stata commands useful in epidemiological research including, but not limited to, descriptive statistics to estimate the incidence of a binary response and to characterize the demographic information supplied by study participants; statistical tests to identify univariate predictors associated with the binary response; graph the incidence of a binary response as a function of a predictor; and table of standardized means and proportions. Students will also be introduced to Stata codes for regression models. Particular focus is placed on applications pertaining to public health and health services research.

EPID 9131  Epidemiology of Infectious Diseases of Direct Interpersonal Transmission
3 Credit Hours.  3 Lecture Hours.  0 Lab Hours.
This course covers advanced topics in epidemiology of infectious diseases of direct interpersonal transmission, except sexual and bloodborne transmission. These include infectious diseases that are transmitted via airborne transmission, droplet transmission, or transmission via fomite or touching, etc. Important themes may include emergency preparedness and response (including outbreaks and pandemics), surveillance, as well as interventions that prevent and control transmissions. Computational, mathematical and statistical tools relevant to the practice of infectious disease epidemiology will be introduced.

EPID 9132  Epidemiology of Infectious Diseases Transmitted via Bodily Fluids
3 Credit Hours.  3 Lecture Hours.  0 Lab Hours.
This course covers advanced topics in epidemiology of infectious diseases transmitted via bodily fluids, primarily sexually transmitted infections and bloodborne infections. Important themes may include outbreak preparedness and response, surveillance, and interventions that prevent and control transmissions. Computational, mathematical and statistical tools relevant to the practice of infectious disease epidemiology will be introduced.
Prerequisite(s): A minimum grade of "C" in EPID 9131.

EPID 9231  Chronic Disease Epidemiology
3 Credit Hours.  3 Lecture Hours.  0 Lab Hours.
This course is designed to introduce the student to the ever-expanding area of chronic disease epidemiology. Students will be introduced to the current status of chronic disease and control programs, methods used in chronic disease surveillance, intervention methods, and modifiable risk factors. Some of the major chronic diseases such as cancer, cardiovascular disease, chronic lung disease, diabetes and arthritis will be discussed in detail. Pathophysiology and clinical features of common chronic conditions will also be presented.

EPID 9232  Cardiovascular Disease Epidemiology
3 Credit Hours.  3 Lecture Hours.  0 Lab Hours.
This course is designed to enhance understanding about the determinants of cardiovascular diseases in populations and how to intervene most effectively to reduce morbidity and mortality due to stroke and heart disease. Emphasis is placed on the social determinants, behavioral risk factors, nutritional and dietary influences, and policy intervention of cardiovascular diseases. In addition, the course provides students with hands on experience to characterize the frequency and impact of chronic diseases and their risk factors from global, national and local perspective using public data available through the Center of Disease Control and Prevention and other sources.

EPID 9233  Cancer Epidemiology
3 Credit Hours.  3 Lecture Hours.  0 Lab Hours.
This course uses a combination of lecture, student discussion and independent research to review the fundamentals of cancer epidemiology including classic descriptive cancer EPI, basic cancer biology, etiology of common and uncommon human cancers, major and minor risk factors for cancer, screening techniques for early detection, cancer biomarkers, and current research in cancer epidemiology. Epidemiologic surveillance techniques including cancer registries and databases, international studies and intervention trials will also be covered. Study designs and epidemiologic methodology used in cancer research will be discussed throughout the course.

EPID 9431  Mental Health Epidemiology
3 Credit Hours.  3 Lecture Hours.  0 Lab Hours.
This course will explore factors that determine the frequency and distribution of mental health problems in populations. Strategies for mental health intervention will also be discussed.