

# MASTER OF SCIENCE IN THE FIELD OF PUBLIC HEALTH MICROBIOLOGY AND EMERGING INFECTIOUS DISEASES

Program Co-Directors: M. Ghosh and I. Kuo

## Mission

The mission of the master of science (MS) in the field of public health microbiology and emerging infectious diseases degree program is to provide training to a new generation of public health professionals to expand knowledge and expertise in the areas of disease mechanisms, with an emphasis on microbial pathogens, the use and application of modern biotechnologies, and in epidemiologic skills relevant to the prevention and control of problems in the community arising from infectious diseases.

Graduates of the MS program have an in-depth understanding of the major laboratory, clinical, and public health aspects of humankind's microbial pathogens, and acquire epidemiologic skills relevant to the prevention and control of problems arising from infectious diseases and modern biotechnologies. Areas of emphasis include the design and analysis of epidemiologic data; emerging infections; tropical diseases; and applications of genomics, proteomics, and bioinformatics. MS graduates are employed in academic and industrial research laboratories, international health agencies, NGOs, and private consulting groups. In addition, they may work in federal, state, and local public health agencies or state and local public health laboratories where their technical expertise and population-based perspective are extremely useful. Students earning this degree help meet a national demand that has reached critical proportions for a trained workforce in biodefense and emerging infections, and an international demand for training in diseases that affect the developing countries.

## Goals

The goals of the MS program in the field of public health microbiology and emerging infectious diseases are to ensure that graduates:

- Identify the biological complexities of microbial pathogens and the diseases they cause
- Recognize the major epidemiologic and clinical features of microbial disease
- Identify how new biotechnologies (including genomics, proteomics, and bioinformatics) can be applied to the study and control of microbial pathogens
- Develop an in-depth understanding of epidemiologic principles and practice
- Apply the principles of epidemiology, microbiology, and public health practice toward the detection, surveillance, investigation, and control of microbial diseases

Visit the program website (<https://publichealth.gwu.edu/programs/public-health-microbiology-and-emerging-infectious-diseases-ms/>) for additional information.

## ADMISSIONS

Visit the Milken Institute School of Public Health website (<https://publichealth.gwu.edu/>) for additional information about academic programs and information about GWSPH. Graduate admissions information, including application requirements and deadlines, can be found on the GWSPH Graduate Admissions website (<https://publichealth.gwu.edu/admissions/graduate-admissions/>).

## REQUIREMENTS

The following requirements must be fulfilled: 45 credits, including 10 credits in foundational courses, 23 credits in program-specific courses, 8 credits in elective courses, and 4 credits in field/laboratory experience and final project.

Code	Title	Credits
<b>Required</b>		
Foundational courses (10 credits)		
PUBH 6002	Biostatistical Applications for Public Health	
PUBH 6003	Principles and Practices of Epidemiology	
PUBH 6007	Social and Behavioral Approaches to Public Health	
PUBH 6080	Pathways to Public Health	
PUBH 6275	Essential Public Health Laboratory Skills	
Program-specific courses (23 credits)		
PUBH 6245	Infectious Disease Epidemiology	
PUBH 6247	Epidemiologic Methods I: Design of Health Studies	
PUBH 6259	Epidemiology Surveillance in Public Health	
PUBH 6262	Introduction to Geographic Information Systems	
PUBH 6276	Public Health Microbiology	
PUBH 6278	Public Health Virology	
PUBH 6291	Infection and Immunity	
or MICR 8210	Infection and Immunity	
PUBH 6853	Use of Statistical Packages for Data Management and Data Analysis	
PUBH 6861	Public Health Genomics	

**Electives**

8 credit in courses selected from the following and/or other courses approved in advance by the advisor.

PUBH 6011 Environmental and Biological Foundations of Public Health

PUBH 6233 Epidemiologic Principles and Practice of Disease Eradication

PUBH 6234 Epidemiologic Methods in Neglected Tropical Disease Control

PUBH 6238 Molecular Epidemiology

PUBH 6239 Epidemiology of Foodborne and Waterborne Diseases

PUBH 6240 Pediatric HIV/AIDS

PUBH 6242 Clinical Epidemiology and Public Health: Reading the Research

PUBH 6243 Topics in Clinical Epidemiology and Public Health: Reading the Research

PUBH 6250 Epidemiology of HIV/AIDS

PUBH 6252 Epidemiologic Methods II: Advanced Epidemiologic Methods

PUBH 6253 Issues in HIV Care and Treatment

PUBH 6255 Organizational Responses to the Local, National, and Global HIV/AIDS Epidemics

PUBH 6263 Advanced GIS

PUBH 6271 Disaster Epidemiology

PUBH 6272 Epidemiology of Infectious Agents Associated with Human Cancer

PUBH 6282 Introduction to R Programming for Epidemiology

PUBH 6299 Topics in Epidemiology (Epidemiology of Sexually Transmitted Infections) \*

PUBH 6455 Global Vaccinology

PUBH 6484 Prevention and Control of Vector Borne Diseases

PUBH 6486 Global Health Programs and Approaches to the Control of Infectious Diseases

MICR 6292 Tropical Infectious Diseases

MICR 8230 Molecular and Cellular Immunology

**Field/laboratory experience and final project (4 credits)**

PUBH 6016 Field/Laboratory Experience

PUBH 6280 Microbiology and Emerging Infectious Diseases Final Project

\*For PUBH 6299, only the specified topics count toward pre-approved elective courses.