DEPARTMENT: Global Health and Environmental Health

COURSE NUMBER: GH580/EH546  SECTION NUMBER 000  SEMESTER: Spring 2015

CREDIT HOURS: 2 academic credit hours for matriculating graduate students at Emory University. Surveillance public health physicians, veterinarians and nurses may take the course for Continuing Medical Education (30 contact hours), and Continuing Education (3.0 units) respectively. Veterinarians may also take the course for credit for the AAVSBS requirements. Other surveillance practitioners may take the course for Continuing Education or professional development*

MEETING TIMES: January 5-9, 2015 (Monday-Friday) from 8:30 am – 5:30 pm.
January 10, 2015 (Saturday) from 8:30 am-12:30 pm.

Lecture Room: CNR Auditorium

INSTRUCTOR NAMES/CONTACT INFORMATION:

Michael J. Beach, PhD
Associate Director for Healthy Water
National Center for Emerging and Zoonotic Diseases
Centers for Disease Control and Prevention
mbeach@cdc.gov

Benjamin Silk, PhD, MPH
Enteric Diseases Epidemiology Branch
Centers for Disease Control and Prevention
ekj8@cdc.gov
404-639-0536

Patricia M. Griffin, MD
Chief, Enteric Diseases Epidemiology Branch
Division of Foodborne, Waterborne, and Environmental Diseases
National Center for Emerging and Zoonotic Infectious Diseases
Centers for Disease Control and Prevention
pgriffin@cdc.gov

Andi L. Shane, MD, MPH, MSc
Associate Professor of Pediatrics and Global Health
Division of Infectious Disease
Emory University School of Medicine
Marcus Professor of Hospital
Centers for Disease Control and Prevention
ashane@emory.edu

Aron Hall, DVM, MSPH, DACVPM
Division of Viral Diseases
National Center for Immunization and Respiratory Diseases
Centers for Disease Control and Prevention
ajhall@cdc.gov
404-639-1869

Coordinator for non-matriculating students:

Maria Sullivan
Department of Global Health
masulli@emory.edu
404-727-8797

Eric Mintz, MD, MPH
Division of Foodborne, Waterborne, and Environmental Diseases
Centers for Disease Control and Prevention
edm1@cdc.gov
404-639-3461

Gene J. Gargarosa MD, MS
Professor Emeritus, Department of Global Health
EJG1926@aol.com
770-491-0688
Epidemiology and infection Prevention

Casey Barton Behravesh MS, DVM, DrPH, DACVPM
Commander, U.S Public Health Service
Deputy Branch Chief, Outbreak Response and Prevention Branch
DFWED Coordinator for Enteric Zoonoses and One Health
Division of Foodborne, Waterborne, and Environmental Diseases
National Center for Emerging Zoonotic Infectious Diseases
Centers for Disease Control and Prevention
dlx9@cdc.gov
404-639-0367

Robert V. Tauxe, MD, MPH
Deputy Director, Division of Foodborne, Waterborne, and Environmental Diseases
National Center for Emerging and Zoonotic Infectious Diseases
rtauxe@cdc.gov
404-639-1603

Jan Vinjé, PhD
Division of Viral Diseases
National Center for Immunization and Respiratory Diseases
Centers for Disease Control and Prevention
jvinje@cdc.gov
404-639-3721

Christine L. Moe, MS, PhD
Departments of Global Health, Environmental Health, and Epidemiology
Director, Center for Global Safe Water
clmoe@emory.edu
404-727-9257
Claudia Nance Rollins, Room 6041
BRIEF COURSE DESCRIPTION
This is a course on the microbiology and surveillance of foodborne and waterborne diseases designed for public health practitioners and other students interested in the safety of food and water. It provides a broad overview of the major foodborne and waterborne diseases. The course describes how information from surveillance is used to improve public health policy and practice in ways that contribute to the safety of our food and water. We focus on the pathogens responsible for food- and water-transmitted diseases. We discuss the diseases they cause, the pathogenesis, clinical manifestations, reservoirs, modes of transmission, and epidemiology. We cover the transport, survival, and fate of pathogens in the environment, the concept of indicator organisms as surrogates for pathogens, the removal and inactivation of pathogens and indicators by water and wastewater treatment processes.

SCHOOL LEVEL, DEPARTMENT, AND/ OR PROGRAM COMPETENCIES
At the conclusion of this course students will be able to:

- Identify leading host and environmental factors in food and waterborne diseases (F&WBD)
- Identify leading etiological agents and their biological properties affecting their transmission, and the diseases they cause
- Understand how foodborne and waterborne disease surveillance systems operate and how the data from these systems are used; and how public policies have evolved from surveillance and outbreak investigations.
- Identify strategies and health infrastructures for the control of F&WBD
- Recognize the role of the hazardous analysis and critical control points (HACCP) strategy to identify risks in the production of food and water
- Understand the economic consequences of contaminated food products and outbreaks
- Facilitate networking among surveillance practitioners and CDC surveillance coordinators

LEARNING OBJECTIVES ASSOCIATED WITH THE COMPETENCIES

Infectious Disease Concentration:
Basic microbiology of pathogens, major transmission routes of infectious diseases, pathogen virulence factors, relative burden of morbidity and mortality, and appropriate prevention and control strategies for infectious diseases.

ACADEMIC HONOR CODE
The RSPH Honor Code requires that all material submitted by a student in fulfilling his or her academic course of study must be the original work of the student.
EVALUATION

1. This course is offered for two academic credit hours for matriculating graduate students at Emory University.

2. Surveillance public health physicians, veterinarians and nurses may take the course for Continuing Medical Education (30 contact hours), and Continuing Education (3.0 units) respectively. Veterinarians may also take the course for credit for the AAVSB requirements. Other surveillance practitioners may take the course for Continuing Education or professional development*

Pre-course Exam. Students enrolled for Continuing Education Credit are required to take a pre-course examination to provide a quantitative measure of pre-course knowledge. This will be compared to the results of the final exam, to assess whether a knowledge gap has been eliminated or narrowed. Continuing Education students will be asked to take this examination on January 5th at 7:30am before the first class meets. Further details will be sent by email. **Students enrolled for degree credit DO NOT need to be present for the pre-course exam.**

Final Exam for Emory students will be a take-home, open-book comprehensive exam that will focus on problem solving and will consist of true/false, matching and multiple choice questions. The exam will be posted on Blackboard on Monday January 5, 2014. **Emory students must turn in their final exams by noon on Saturday Jan 17th via Blackboard.**

*Only Emory degree candidates are required to go on the field trip and must take the final exam. Others must take the pre-test and post-test.

**Two reading responses.** There will be 10 discussion threads available pertaining to different articles in the recommended reading section. Students are asked to contribute 2 posts to any of the 10 discussions. Posts should consist of a thoughtful response (at least 3-5 sentences), suggest additional resources (webpages, articles, news stories, etc.) or respond to another student’s post. All posts are due the last day of class. **(JAN 10 AT 5:30PM)**

ALL OF THESE ARE INDIVIDUAL ASSIGNMENTS AND SHOULD BE COMPLETED WITHOUT THE ASSISTANCE OF OTHERS.

Grade Breakdown
20% “The Ghost Map” Quiz (take home – DUE JAN 10 at 5:30 pm via Blackboard)
10% Two reading responses on Blackboard – DUE JAN 10 at 5:30 pm via Blackboard)
20% Enteric Virus, Bacteria and Protozoa Table Assignment (take home – DUE JAN 17 11:59 pm via Blackboard)
50% Final Exam (take home - DUE JAN 17 at 11:59 pm via Blackboard)

TEACHING ASSISTANTS:

Kenzie Kraemer  
Office Hours: 8:00-8:30 AM and 5:30-6:00 PM  
Location: Claudia Nance Rollins (CNR) Auditorium  
Email: kenzie.kraemer@emory.edu  
Tel: (320) 282-3357

Caitlin Smith  
Office Hours: 8:00-8:30 AM and 5:30-6:00 PM  
Location: Claudia Nance Rollins (CNR) Auditorium  
Email: caitlin.breanne.smith@emory.edu  
Tel: (704) 519-5563

Melissa Sizemore  
Office Hours: 8:00-8:30 AM and 5:30-6:00 PM  
Location: Claudia Nance Rollins (CNR) Auditorium  
Email: melissa.anne.sizemore@emory.edu  
Tel: 352.208.2373

SYLLABUS VERSION 5 December 21st, 2014 3
FIELD TRIP (required of all degree-seeking students; optional for continuing education students)
Thursday January 8th, 10:15 am – 3:30 pm “Water and Wastewater Treatment” RM Clayton Water Reclamation Plant and the Chattahoochee Water Treatment Plant.

REQUIRED TEXTBOOK AND READINGS
The Ghost Map: The Story of London’s Most Terrifying Epidemic and How it Changed Science, Cities, and the Modern World, by Steven Johnson (New and used copies available at Amazon. Please read BEFORE the first day of class)

Control of Communicable Diseases Manual, edited by David L. Heymann, American Public Health Association, Washington DC 19th edition. (Previous editions are also acceptable)

Diagnosis and Management of Foodborne Diseases: Primer for PH Practitioners. Revised by E.J. Gangarosa for Public Health Practitioners (Available on Blackboard. Please read BEFORE the first day of class.)


MMWR Surveillance Summaries/September 23, 2011 / Vol. 60 / No. SS--12 / Pg. 1 – 78 (Available on Blackboard)

- Surveillance for Waterborne Disease Outbreaks and Other Health Events Associated with Recreational Water — United States, 2007–2008

AND

MMWR Surveillance for Foodborne Disease Outbreaks - United States, 2008 in MMWR / September 9, 2011 /Vol, 60 / No. 35 (Available on Blackboard)

Students will be expected to read, prior to each lecture, the sections of the required text corresponding to each lecture topic. Students are also asked to bring to class course handouts, readings, and this syllabus. We also recommend printing the final exam and bringing it with you to class as several of the lectures go over questions in the exam.

RECOMMENDED PUBLICATIONS, READINGS, AND MOVIES:
All readings are available on Blackboard unless marked otherwise.


• Glass RL. Beyond discovering the viral agents of acute gastroenteritis. Emerg Infect Dis. 2013 Aug. DOI: 10.3201/eid1908.130773


• Payne DC, Parashar UD. Rapid advances in understanding viral gastroenteritis from domestic surveillance. Emerg Infect Dis. 2013 Aug. DOI: 10.3201/eid1908.130449

• Scallan et al. Foodborne illness acquired in the United States – Major pathogens. Emerging Infectious Diseases 2011 17(1):7-15


• USEPA. Water on Tap: What you need to know. EPA 816-K-09-002, December
2009.

- TED talk: Steven Johnson: *how the “Ghost Map” helped end a killer disease*  
  o http://www.ted.com/talks/steven_johnson_tours_the_ghost_map

Additional selected readings may be announced; those will be available to students on the Blackboard site or in print.

### OPTIONAL TEXTBOOKS


### LAPTOP/CELL PHONE POLICY

No open laptops during class. Please keep your cell phones off or on vibrate.

### COURSE SCHEDULE

The class will meet from 8:30 – 12:00 and 1:00 – 5:30 daily, with a 10-minute break in each morning session and 2-10 minute breaks during the afternoon session. Select faculty will be available to meet with students in the classroom from 5:30 – 6:00 each day.

#### Program for DAY 1 – Monday, January 5th

**9:00 – 9:20**  
Course overview and discussion of syllabus – Dr. Christine Moe

**9:20 – 10:30**  
Introduction to Foodborne and Waterborne Pathogens and Infectious Diseases Principles – Dr. Christine Moe

**10:30 – 10:40** Break

**10:40 – 12:00**  
Cholera as a Prototype for Diarrheal Diseases: a perspective of its “legacy”, its impact on public health, and research it stimulated culminating in a new paradigm for the treatment of life-threatening diarrheal diseases. Includes a video segment entitled ‘Cholera Today,’ – Dr. Gene Gangarosa and Dr. Andi Shane

**12:00 – 1:00** Lunch Break

**1:00 – 2:30**  
Cholera in Africa and Haiti – Dr. Eric Mintz
2:30 – 2:40 Break

2:40 – 3:50 Cholera in the Environment – Dr. Christine Moe

3:50 – 4:00 Break

4:00 – 5:30 Introduction to Surveillance – Dr. Ben Silk and Dr. Brendan Jackson

Program for DAY 2 – Tuesday, January 6th

8:30 – 10:00 Surveillance systems for foodborne and other acute enteric illnesses in the United States – Dr. Patricia Griffin

10:00 – 10:10 Break

10:10 – 11:30 Estimates of foodborne illness acquired in the United States – Dr. Patricia Griffin

11:30 – 12:00 Video: “Modern Meat”

12:00 – 1:00 Lunch Break

1:00 – 2:20 What’s All the Fuss About Antibiotic Resistance? (With a Focus on Enteric Bacteria) – Dr. Patricia Griffin

2:20 – 2:30 Break

2:30 – 4:00 Sharing Shigella – Dr. Andi Shane

4:00 – 4:10 Break

4:10 – 4:20 TED talk: “Steven Johnson: How the “ghost map” helped end a killer disease”

4:20 – 5:30 Interactive discussion about The Ghost Map (Discussion based on Ghost Map Study Guide) – Dr. Gene Gangarosa and Dr. Christine Moe

Program for DAY 3 – Wednesday, January 7th

8:30 – 9:30 Overview of emerging foodborne pathogens and trends – Dr. Rob Tauxe

9:30 – 10:20 Pathogen Virulence Factors – Dr. Gene Gangarosa and Dr. Andi Shane

10:20 – 10:30 Break

10:30 – 11:30 Campylobacter and Salmonellosis: Epidemiology and Control – Dr. Rob Tauxe

11:30 – 12:00 Video: Dirty Kitchens

SYLLABUS VERSION 5 December 21st, 2014
12:00 – 1:00 Lunch Break
1:00 – 2:30 Investigation of a Listeriosis Outbreak – Dr. Ben Silk and Dr. Brendan Jackson
2:30 – 2:40 Break
2:40 – 4:10 Waterborne Diseases Surveillance History and Overview – Dr. Michael Beach
4:10 – 4:20 Break
4:20 – 5:30 Waterborne Protozoan Diseases – Dr. Michael Beach

Program for DAY 4 – Thursday, January 8th
8:30 – 10:20 Water and Wastewater Treatment – Dr. Christine Moe
10:30 – 3:30 Field Trip: Water and Wastewater Treatment - Dr. Christine Moe
3:30 – 5:30 Environmental transmission routes and microbial indicator organisms – Dr. Christine Moe

Program for DAY 5 – Friday, January 9th
8:30 – 9:50 Enteric Zoonoses and One Health – Dr. Casey Barton Behravesh
9:50 – 10:00 Break
10:00 – 12:00 Enteric Viruses and Prions and Current Research – Dr. Christine Moe
12:00 – 1:00 Lunch
1:00 – 2:20 CaliciNet surveillance network and targeted interventions against enteric viruses (antiviral agents, norovirus vaccine) – Dr. Jan Vinjé
2:20 – 2:30 Break
3:40 – 3:50 Break
3:50 – 5:30 Roll Over Rotavirus – Dr. Andi Shane
Program for DAY 6 – Saturday, January 10th

9:00 – 10:00  HACCP principles and practice – Dr. Gene Gangarosa and Dr. Christine Moe

10:00 – 10:50 Remembering the Global Burden of Food and Waterborne Diseases – UNICEF’s Children’s Summit video – Dr. Gene Gangarosa

10:50 – 11:00 Break

11:00 – 12:30 Final exam review. Time for on-line course evaluation and to provide comments about course to instructors.

*Turn in a completed hard copy of “The Ghost Map” take home quiz.*