

Course Title: Infectious Disease Epidemiology

Course Number: EPID 0552

Course Pre- and Co-requisite(s): PHCO 0502 and PHCO 0504

Course Location: SPH, Piscataway Classroom 2A

Course Date & Time: Wednesdays 6pm-8pm

Course Instructor: Jason Mehr, MPH, CIC. Healthcare-associated Infections Coordinator, New Jersey Department of Health

Office Hours: By Appointment Only

Course Assistant: N/A

Course Website: canvas.rutgers.edu

Required Course Text: Control of Communicable Diseases Manual 20th Edition; Editor David L. Heymann MD.

Additional/Supplemental Readings/Resources: Infectious Disease Epidemiology Theory and Practice Third Edition; Kenrad E. Nelson and Carolyn Masters Williams

Course Description: This course is an introduction to infectious disease epidemiology and public health infectious disease investigations. Students will learn about how epidemiology theories and concepts are applied to real world disease investigations involving respiratory, foodborne, vaccine preventable, and healthcare-associated infections. Additionally, students will evaluate evidence on infection prevention measures including proper PPE usage, hand hygiene, environmental cleaning, and injection safety.

Selected Concentration Competencies Addressed: Each Concentration identifies competencies for each degree offered. The competencies addressed in this course for the MPH include:

- A- Critique epidemiologic literature, assess its strengths and weaknesses, and determine if conclusion(s) are supported
- B- Use epidemiologic techniques to quantitatively assess patterns and changes in disease occurrence
- C- Formulate a specific hypothesis and determine an appropriate study design and analysis plan
- D- Design, implement, and assess ordinary data collection systems for public health research
- E- Design and implement basic quality control methods during data entry and analysis
- F- Appropriately analyze and interpret epidemiologic data, including large national and state level datasets
- G- Communicate and present study findings to professional audiences

Please visit the Concentration webpages on the School of Public Health’s website at sph.rutgers.edu for additional competencies addressed by this course for other degrees and concentrations.

Course Objectives: By the completion of this course, students will be able to:

- a- Describe the differences between theoretical and applied epidemiology in relation to infectious diseases.
- b- Explain the steps to an outbreak investigation and apply real examples
- c- Characterize the differences between viruses, fungi, and bacteria.
- d- Evaluate the pros and cons of different prevention and control measures.
- e- Understand of multitude of factors that play a role of infectious disease transmission.
- f- Describe the basics tenets of infection prevention and control

| Competency | Course Objective(s) | Lessons | Assessment(s) |
|------------|---------------------|--|---|
| A | a, c, d, e | 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 14, 15 | Mid-term, Final, Quiz 1, 2, 3, Group activity |
| B | a, b, c, e | 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 14, 15 | Mid-term, Final, Quiz 1, 2, 3, Group activity |
| C | a, b, f | 1, 2, 3, 5, 14, 15 | Mid-term, Final, Quiz 1, 2, Group activity |
| D | a, b, d, e, f | 1, 2, 3, 5, 11, 14, 15 | Mid-term, Final, Quiz 1, 2, Group activity |
| E | a, f | 1, 2, 3, 14, 15 | Mid-term, Final, Quiz 1, Group activity |
| F | a, b, c, d | 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 14 | Mid-term, Final, Quiz 1, 2, 3, Group activity |
| G | c | 4, 6, 7, 9, 10, 11 | Mid-term, Final, Quiz 2, 3, Group activity |

Course Requirements and Grading:

- Exams and Quizzes: There will be a standard mid-term and final examination, which will encompass the first half and then the entirety of the semester, respectively. Additionally, there will be a total of 10 reading quizzes given throughout the semester, due before class begins on the specific day. The quizzes will be based on the reading assignment due for that class week. There will be no quizzes in weeks where no readings are assigned. These short quizzes (approx. 5 questions) will be posted online the week before on the class website. Quizzes must be completed before class begins the week that reading topic is due. Only 9 quizzes will count toward the quiz grade, so the lowest quiz will be “dropped”.
- Online 30 Participation: Every week there will be an Online 30 assignment posted on the Canvas website. The assignment will consist of reading an article or guidance document and posting about it in the course forum. Examples include about what you found interesting/enlightening from the article, evaluation of methods/study design, or implications for future studies or guidance. Each student is expected to post or contribute to someone else’s thread at least once before class each week.

- **Group Activity:** On week 11 there will be a tabletop exercise group activity where the class will walkthrough an example outbreak investigation scenario. Students will be asked to participate with classmates to determine the correct steps in how to identify, track and contain an outbreak of an antimicrobial resistant organism in a healthcare facility. Students will have an individual writing assignment after this outbreak group activity day that will tie in the scenario and discuss lessons learned. The writing assignment will be due the week before the Final.
- **Class Participation:** Students are expected to be attentive and active participants in class. Excessive unexcused absences will adversely affect the class participation grade.
- **Grading is weighted as follows:**

| | |
|-------------------------------|------------|
| 1. Reading Quizzes | 20% |
| 2. Mid-term | 20% |
| 3. Final Examination | 20% |
| 4. Outbreak Scenario Write-Up | 15% |
| 5. Online 30 Participation | 15% |
| 6. Class Participation | <u>10%</u> |
| Total: | 100% |

Grading Policy:

| | |
|----------|----|
| 94 – 100 | A |
| 90 – <94 | A- |
| 87 – <90 | B+ |
| 84 – <87 | B |
| 80 – <84 | B- |
| 77 – <80 | C+ |
| 70 – <77 | C |
| <70 | F |

Course Schedule:

| Week | Date | Topic | Readings | Events |
|------|----------|---|--|----------------|
| 1 | 9/07/22 | Course Introduction, public health infrastructure | None | |
| 2 | 9/14/22 | Key principles of infectious disease epidemiology | Infectious Disease Epi Chapter 2-3 (pages 19-76) | Reading Quiz 1 |
| 3 | 9/21/22 | Infectious disease dynamics and molecular epidemiology | Infectious Disease Epi Chapter 6 (pages 131-158) Chapter 9 (219-251) | Reading Quiz 2 |
| 4 | 9/28/22 | Outbreak investigation basics, steps to an outbreak investigation | Infectious Disease Epi Chapter 5 (pages 105-127) CD Manual A8-A12 | Reading Quiz 3 |
| 5 | 10/05/22 | Respiratory Pathogens | CD Manual* | Reading Quiz 4 |
| 6 | 10/12/22 | Foodborne Pathogens | CD Manual* | Reading Quiz 5 |
| 7 | 10/19/22 | Legionella/Waterborne Diseases | APIC/CDC resources CD Manual (A28-A38) | Reading Quiz 6 |

| | | | | |
|----|----------|--|---|---|
| | | | CDC Toolkit for Controlling Legionella and Fact Sheet | |
| 8 | 10/26/22 | None | | Mid-Term |
| 9 | 11/02/22 | Infection Control | APIC/CDC resources CD Manual (A28-A38) | Reading Quiz 7 |
| 10 | 11/09/22 | Healthcare-associated infections and antimicrobial resistant pathogens | CD Manual* | Reading Quiz 8 |
| 11 | 11/16/22 | Group activity- outbreak scenarios | None | Group activity- outbreak scenarios |
| 12 | 11/23/22 | Injection safety | None | None |
| 13 | 11/30/22 | Zoonotic/Vector-borne Diseases | CD Manual* | Reading Quiz 9 Outbreak write-up due |
| 14 | 12/07/22 | Vaccine Preventable Diseases | CD Manual* | Reading Quiz 10 |
| 15 | 12/14/22 | None | None | Final |

***CD Manual Readings:**

Foodborne: *Campylobacter* (85-89), *Cholera/vibrioses* (102-115), *Cryptosporidiosis* (136-139), *Cyclosporiasis* (139-141), *E. Coli* (158-173), *Hepatitis A* (253-257), *Salmonellosis* (532-539), *Shigellosis* (556-561)

Respiratory: *Enterovirus* (190-196), *Influenza* (306-323), *Legionellosis* (334-337), *SARS/MERS* (539-550)

Vaccine Preventable Diseases: *Diphtheria* (150-155), *Hepatitis B* (257-264), *Measles* (389-397), *Mumps* (419-423), *Pertussis* (449-455), *Poliomyelitis* (477-484), *Rubella* (527-532), *Tetanus* (607-614), *Varicella* (669-675)

Zoonotic/Vector-borne: *Arboviral Diseases* (26-54), *Brucellosis* (78-81), *Dengue* (144-150), *Ebola* (173-178), *Hantavirus* (245-249), *Lyme* (363-367), *Malaria* (372-389), *Rabies* (497-508), *West Nile Virus* (675-679), *Yellow Fever* (683-689)

Healthcare-associated Infections: *Aspergillosis* (58-61), *Fungal Diseases* (227-234), *Mucormycosis* (416-419), *Staphylococcal Diseases* (571-581)

Learning Management System: Canvas will be used extensively throughout the semester for course syllabus, assignments, announcements, communication and/or other course-related activities. It is the student's responsibility to familiarize themselves with Canvas and check it regularly. If you have difficulties accessing Canvas, please inform the instructor and Canvas Support (help@canvas.rutgers.edu). Canvas is accessible at canvas.rutgers.edu.

School of Public Health Honor Code: The School of Public Health Honor Code is found in the School Catalog (sph.rutgers.edu/academics/catalog.html). Each student bears a fundamental responsibility for maintaining academic integrity and intellectual honesty in his or her graduate work. For example, all students are expected to observe the generally accepted principles of scholarly work, to submit their own rather than another's work, to refrain from falsifying data, and to refrain from receiving and/or giving aid

on examinations or other assigned work requiring independent effort. In submitting written material, the writer takes full responsibility for the work as a whole and implies that, except as properly noted by use of quotation marks, footnotes, etc., both the ideas and the works used are his or her own. In addition to maintaining personal academic integrity, each student is expected to contribute to the academic integrity of the School community by not facilitating inappropriate use of her/his own work by others and by reporting acts of academic dishonesty by others to an appropriate school authority. It should be clearly understood that plagiarism, cheating, or other forms of academic dishonesty will not be tolerated and can lead to sanctions up to and including separation from the Rutgers School of Public Health.

Students with Disabilities: Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student must apply for Services by first completing a Registration Form with the Rutgers Office of Disability Services (ODS) at ods.rutgers.edu. The student will also be required to participate in an ODS intake interview and provide documentation. If reasonable accommodations are granted, ODS will provide you with a Letter of Accommodations which should be shared with your instructors as early in your courses as possible.

Commitment to Safe Learning Environment: The Rutgers School of Public Health is committed to helping create a safe learning environment for all students and for the School as a whole. Free expression in an academic community is essential to the mission of providing the highest caliber of education possible. The School encourages civil discourse, reasoned thought, sustained discussion, and constructive engagement. Provocative ideas respectfully presented are an expected result. An enlightened academic community, however, connects freedom with responsibility. The School encourages all students to disclose any situations where you may feel unsafe, discriminated against, or harassed. Harassment or discrimination of any kind will be not tolerated and violations may lead to disciplinary actions.

Reporting Discrimination or Harassment: If you experience any form of gender or sex-based discrimination or harassment, including sexual assault, sexual harassment, relationship violence, or stalking, know that help and support are available. You may report such incidents to the [RBHS Title IX Office](#) or to the School of Public Health's [Office of Student Affairs](#). Rutgers University has staff members trained to support survivors in navigating campus life, accessing health and counseling services, providing academic and housing accommodations, and more. If you experience any other form of discrimination or harassment, including racial, ethnic, religious, political, or academic, please report any such incidents to the School's [Office of Student Affairs](#). The School strongly encourages all students to report any incidents of discrimination or harassment to the School. Please be aware that all Rutgers employees (other than those designated as confidential resources such as advocates, counselors, clergy and healthcare providers as listed in Appendix A to [Policy 10.3.12](#)) are required to report information about such discrimination and harassment to the School and potentially the University. For example, if you tell a faculty or staff member about a situation of sexual harassment or sexual violence, or other related misconduct, the faculty or staff member must share that information with the [RBHS Title IX Coordinator](#). If you wish to speak to a confidential employee who does not have this reporting responsibility, you can find a list of resources in Appendix A to University [Policy 10.3.12](#). For more information about your options at Rutgers, please visit [Rutgers Violence Prevention and Victim Assistance](#).

Graduate Student Computer Policy: Students are required to possess a personal laptop, no older than approximately two years, that must meet minimum requirements which may be found online at: sph.rutgers.edu/student-life/computer-support.html

Policy Concerning Use of Recording Devices and Other Electronic Communications Systems: When personally owned communication/recording devices are used by students to record lectures and/or classroom lessons, such use must be authorized by the faculty member or instructor who must give either

oral or written permission prior to the start of the semester and identify restrictions, if any, on the use of mobile communications or recording devices.

Policy Concerning Use of Turnitin: Students agree that by taking this course all required papers may be subject to submission for textual similarity review to Turnitin.com (directly or via learning management system, i.e. Canvas) for the detection of plagiarism. All submitted papers will be included as source documents in the Turnitin.com reference database solely for the purpose of detecting plagiarism of such papers. Use of the Turnitin.com service is subject to the Usage Policy posted on the Turnitin.com site. Students who do not agree should contact the course instructor immediately.

Withdrawal/Refund Schedule: Students who stop attending their course(s) without submitting a completed [Add/Drop Course](#) form will receive a failing grade. Furthermore, students dropping to zero credits for the semester are considered withdrawn and must submit a completed [Leave of Absence](#) form from the School of Public Health's Office of Student Affairs. The School of Public Health refunds tuition only. Administrative and technology fees are non-refundable. You may find the Withdrawal/Refund Schedule on the School of Public Health website at: sph.rutgers.edu/academics/academic-calendar.html