

**COMMUNITY & SOCIAL SERVICES SUBCLUSTER
ADVANCED PRINCIPLES OF PUBLIC HEALTH
COURSE CODE 5587**

COURSE DESCRIPTION: This advanced course will provide information for students to acquire an understanding of various kinds of research that promote public health. This course will provide an understanding of the various topics and concepts including epidemiology, immune system, outbreak investigation, public health surveillance, ethics and research study designs. The inquiry-based instruction of this course allows students to engage in problem solving, decision-making, critical thinking, and applied learning, to provide every student with the opportunity to be successful not only in this course but hereafter.

COURSE OBJECTIVES & OUTCOME: This advanced course will give students more tools for completing their senior capstone and a better understanding of what is involved with epidemiological research. Students taking this course will be better prepared for entry level post-secondary public health courses.

PRE-REQUISITE: - Foundations of Public Health

OPTIONAL ADDITIONAL COURSEWORK: A medical terminology course is encouraged during the public health pathway as a co-requisite.

GENERAL REQUIREMENTS: This course is most appropriate for students in grades 11-12. Students enrolled in this course must have successfully completed the required pre-requisites.

CREDIT: CP Credit =one (1) unit (120 hours)- Honors credit available using the process in the South Carolina Uniform Grading Policy as posted on the SCDE website.

CLASS SIZE: This course is recommended to have a maximum of 24 students in one class.

Note: *Please refer to the completer requirements found on the SCDE Health Science web page for the most up to date information*

CONCENTRATOR PATHWAY: Foundations of Public Health and Advanced Principles of Public Health

THREE UNIT COMPLETER PATH: Health Science 1 *or* PLTW Principles of Biomedical Science, plus Foundations of Public Health, and Advanced Principles of Public Health

FOUR UNIT COMPLETER PATHWAY: Health Science 1 or PLTW Principles of Biomedical Science, plus Foundations of Public Health, Advanced Principals of Public Health, and students' choice of: Public Health Research (capstone course), or any other health science course in which they have met the pre-requisites.

STACKABLE CREDENTIALS: Please refer to the most up-to-date credentials on the SCDE website or check the Student Reporting Procedures Guide (SRPG).

STANDARDS:

I. INTRO TO EPIDEMIOLOGY

- a. Describe and illustrate chain of infection.
- b. Differentiate modes of transmission (direct, indirect, vector, foodborne, airborne, waterborne, soil/arthropodborne).
- c. Identify patient zero.
- d. Calculate incubation periods.
- e. Identify sporadic, endemic, epidemic, pandemic.
- f. Distinguish notifiable diseases.
- g. Review of social determinants of health.

ACTIVITIES: Patient Zero, consequences of transmission

- [Spreading sickness \(cost benefit analysis assessment\)](#)
- [Epidemiologist: Disease Detectives](#)
- [2 Seeking the Cause \(patient zero\)](#)
- [Outbreak Activity: Finding Patient Zero](#)
- [Social Determinants of Health | Healthy People 2020](#)
- [Teaching Pack: Social Determinants of Health](#)
- [Social Determinants of Health - Healthy People 2030 | health.gov](#)
- [Unit 2 Infectious Disease](#)
- [Teaching Epidemiology](#)

II. THE IMMUNE RESPONSE

- a. Define and recognize the immune system.
- b. Distinguish types of immune systems (innate vs adaptive).
- c. Research and describe vaccines (different types, for example live attenuated genetically modified)
- d. Summarize herd immunity.

ACTIVITIES:

- [How the immune system works](#)
- [Innate immune system](#)
- [Adaptive immune system](#)
- [History of Vaccines](#)
- [Types of Vaccines](#)
- [How vaccines are made](#)
- [Herd Immunity](#)
- [Herd Immunity simulation](#)
- [PBS documentary frontline Vaccine wars](#)
- [Summative Unit 1 Choice Board](#)
- [Spreading sickness \(cost benefit analysis assessment\)](#)
- [Unit 1 Vaccines](#)

III. EPIDEMIOLOGICAL APPROACH

- a. Identify steps in an investigation (scientific method).
- b. Define and apply a case definition.
- c. Research agency responsibility.

- d. Describe methods of detection.
- e. Determine when to investigate (by severity, transmission, ongoing, etc.)
- f. Follow the Chain of infection.

ACTIVITIES: Outbreak investigations

- [Operation Outbreak: Activity 1](#)
- [Investigating an Outbreak | Science Ambassador Fellowship | Career Paths to Public Health](#)
- [Disease Outbreak Investigation](#)
- [Microbial Discovery Activity](#)
- [Course: Outbreak Investigation](#)
- [Case Study – Outbreak at a Conventionsph.unc.edu › sites › 2015/08 › nciph-epiteams-cs3-fac](#)
- [Activity name: Outbreak Simulation](#)
- [Unit 4 Outbreak Investigation](#)

IV. CAUSATION AND RISK (MEASURING DISEASE AND DEATH)

- a. Calculate incidence and prevalence.
- b. Distinguish and calculate risk ratio, odds ratio, rate ratio.
- c. Interpret and calculate morbidity and mortality rates.

ACTIVITIES: Research past Incident -assignment and presentation.

- [Unit 3 Epi rates](#)
- [Curb the Epidemic! - Activity](#)
- [ORISE Lesson Plan: Elementary Epidemiology - Disease Investigation Using Basic Math Skills](#)
- [Mathematical Modeling of Disease Outbreak](#)
- [Mathematical epidemiology: How to model a pandemic](#)
- [YES research](#)

V. EPIDEMIOLOGICAL RESEARCH AND DESIGN

- a. Define & Recognize Study types (experimental or observational, descriptive or analytical).
- b. Define and Recognize Study design (cross-sectional, cohort case control, ecologic, randomized trials).
- c. Identify sampling strategies (double blind, placebo-experimental design, random sampling, quota sampling).
- d. Define screening, validity, reliability.
- e. Recognize types of data (quantitative vs. qualitative).
- f. Identify ways to summarize data.
- g. Identify confounding variable.
- h. Analyze bias (selection bias, informational bias).

ACTIVITIES: Be able to label and categorize research designs.

- [Confounding variable: Radon exposure](#)
 - [State Cancer Profiles](#)
 - [County health rankings](#)
 - [Radon video](#)
 - [radon maps](#)
 - [EPA](#)
- [Unit 5 Research and Study Design](#)

- [Collecting Data | Epidemic Intelligence Service](#)
- [Module 4 - Epidemiologic Study Designs 1:](#)
- [Principles of Epidemiology | Lesson 1 - Section 7](#)
- [Designing and Conducting Analytic Studies in the Field | Epidemic Intelligence Service](#)
- [Descriptive Epidemiology](#)
- [Principles of Epidemiology | Lesson 2 - Section 5](#)

VII. SURVEILLANCE, PREVENTION AND INTERVENTION

- Define surveillance.
- Identify problems for surveillance.
 - Environmental exposures
 - Infectious diseases vs. chronic disease
 - Injuries
 - Accidents
 - Natural disasters
 - Agencies responsible (Agency Roles: CDC, DHEC, Red Cross, MRC)
- Define and discuss bioterrorism (FEMA 100 Certification).
- Analyze emotional, social, mental health (anxiety, depression, suicide).
- Explain dissemination of data.
- Identify ways to evaluate and improve surveillance systems.

ACTIVITIES:

- Emergency Preparedness activity, MRC
- POD training with DHEC
- FEMA 100, 700, and 800 certification

ACTIVITIES:

- [Adolescent suicide](#)
- [Principles of Epidemiology | Lesson 5 | Overview](#)
- [Types of Surveillance](#)
- [Surveillance – Foundations of Epidemiology](#)
- [Introduction to Public Health Surveillance|Public Health 101 Series](#)
- [Surveillance unit](#)

VII. INTRODUCTION TO GLOBAL HEALTH

- Examine current issues in global health (pandemics, environmental factors, economic disparities, political factors, noncommunicable diseases, animal health, food sourcing and supply).
- Evaluate and apply case studies.
- Discuss governance and foreign policy.

ACTIVITIES:

- <https://scetv.pbslearningmedia.org/collection/global-health/#.YDeEgy1h1QI>
- [Rx for Survival: A Global Health Challenge](#)
- [Teaching activities](#)
- <https://1cnvnq2oul8e2upwpp47ustn-wpengine.netdna-ssl.com/wp-content/uploads/sites/95/2020/05/CUGH-Global-Health-Toolkit-Web-Version.pdf>

- [Against The Odds: Educator's Guide to Hosting a Global Health Conference](#)
- [New 2016 Global Health Model Lesson Plans](#)

VIII. ETHICS

a. Evaluate Ethical Practices:

- Privacy
- Common good
- Research coercion
- Benefit vs risk
- Informed consent
- Vulnerable populations

ACTIVITIES:

- [Public Health Ethics Resources - OSI - OS](#)
- [Public Health Ethics | Oxford Academic](#)
- [Video: Miss Evers' Boys](#)
- [The Tuskegee Syphilis Study](#)
- [The Tuskegee Syphilis Experiment](#)

RESOURCES

[Science Ambassador Fellowship Homepage | Career Paths to Public Health |](#)

[CDC Centers for Disease Control and Prevention \(cdc.gov\)](#)

<https://www.cdc.gov/careerpaths/k12teacherroadmap/index.html>

[Homepage | SCDHEC](#)

[MRC \(hhs.gov\)](#)

[Home of the Office of Disease Prevention and Health Promotion - health.gov](#)

[NCIPH Training Website : Home \(unc.edu\)](#)

[Training and Education | FEMA.gov](#)

White Knoll High School – Center for Public Health

[Public Health and Advanced Medical Studies \(lexdistrict1.com\)](#)