Public Health and Epidemiology

Primary Career Cluster:	Health Science
Course Contact:	CTE.Standards@tn.gov
Course Code(s):	C14H17
Prerequisite(s):	*Health Science* (C14H14)
Credit:	1
Grade Level:	10
Graduation Requirements:	This course satisfies one of three credits required for an elective focus when taken in conjunction with other Health Science courses.
POS concentrator:	This course satisfies one out of two required courses to meet the Perkins V concentrator definition, when taken in sequence in the approved program of study.
Programs of Study and Sequence:	This is the third course in the *Therapeutic Services* program of study.
Aligned Student Organization(s):	HOSA: http://www.tennesseehosa.org
Coordinating Work-Based Learning:	Teachers are encouraged to use embedded WBL activities such as informational interviewing, job shadowing, and career mentoring. For information, visit https://www.tn.gov/education/educators/career-and-technical-education/work-based-learning.html.
Promoted Tennessee Student Industry Credentials:	**Credentials are aligned with postsecondary and employment opportunities and with the competencies and skills that students acquire through their selected program of study. For a listing of promoted student industry credentials, visit https://www.tn.gov/content/tn/education/educators/career-and-technical-education/student-industry-certification.html.**
Teacher Endorsement(s):	577, 720, 722
Required Teacher Certifications/Training:	None
Teacher Resources:	https://www.tn.gov/education/educators/career-and-technical-education/career-clusters/cte-cluster-health-science.html Best for All Central: https://bestforall.tnedu.gov/

Course at a Glance

CTE courses provide students with an opportunity to develop specific academic, technical, and 21st century skills necessary to be successful in career and in life. In pursuit of ensuring every student in Tennessee achieves this level of success, we begin with rigorous course standards which feed into intentionally designed programs of study.

Students engage in industry relevant content through general education integration and experiences such as career and technical student organizations (CTSO) and work-based learning (WBL). Through these experiences, students are immersed with industry standard content and technology, solve industry-based problems, meaningfully interact with industry professionals, and use/produce industry specific, informational texts.

Using a Career and Technical Student Organization (CTSO) in Your Classroom

CTSOs are a great resource to put classroom learning into real-life experiences for your students through classroom, regional, state, and national competitions, and leadership opportunities. Below are CTSO connections for this course, note this is not an exhaustive list.

- Participate in CTSO Fall Leadership Conference to engage with peers by demonstrating logical thought processes and developing industry specific skills that involve teamwork and project management.
- Participate in contests that highlight job skill demonstration, interviewing skills, community service activities, extemporaneous speaking, and job interview.
- Participate in leadership activities such as Organizational Leadership, Prepared Speaking, HOSA Service Project, Creative Problem Solving, and HOSA Service Project.

For more ideas and information, visit Tennessee HOSA at http://www.tennesseehosa.org/.

Using Work-Based Learning (WBL) in Your Classroom

Sustained and coordinated activities that relate to the course content are the key to successful work-based learning. Possible activities for this course include the following. This is not an exhaustive list.

- **Standards 1.1-1.2** | Invite a public health officer to discuss how legislation affects public health.
- **Standards 2.1-2.2** | Invite postsecondary public health students to speak about the various public health careers that are available.
- **Standards 3.1-3.2** | Virtually partner with the local health department to identify potential HIPPA violations in public health.
- **Standards 4.1-4.5 |** Shadow an epidemiologist
- **Standards 5.1-5.2** | Visit a 911 call center to analyze plans for coordination of health care delivery during a crisis.
- **Standards 6.1-6.4 |** Invite a WIC representative to speak about nutrition programs for women, infants, and children.
- **Standards 7.1-7.2 |** Partner with the local health department to develop a public health education program developed from a local needs assessment that addresses the identified challenge(s) of an at-risk group.

For more ideas and information, visit https://www.tn.gov/education/educators/career-and-technical-education/work-based-learning.html.

Course Description

Public Health and Epidemiology is an applied course for students interested in developing a rich understanding of the ways government tracks health related issues and how communities experience and treat them. Upon completion of this course, students will be able to use research and data to understand the health and wellness of his/her community, state, region, and nation; relate that knowledge to epidemiology and determinants of health; draw key connections between personal health issues and community health issues; defend emergency allocation of resources, and identify professionals who can provide care.

Course Standards

1. **Development of the Public Health System and Legislation**

   1.1 <u>Public Health Systems:</u> Gather relevant information from multiple sources concerning the history of community health, disease outbreaks, historical figures, time periods, and/or practices to **understand how the public health system** has evolved.

   1.2 <u>State and Federal Legislation:</u> Summarize major state and federal legislation related to **community health** using both primary sources (such as laws) and secondary sources (such as media reports). Describe the **effects** of these **laws** on the provision of **healthcare in Tennessee** and the implications for at-risk populations.

2. **Careers**

   2.1 <u>Careers and Educational Requirements:</u> Research **careers within the public health and epidemiology fields** and document educational requirements as well as state and national guidelines governing practicing professionals (such as licensing, certifications, training, compliance). Identify potential **training programs, schools**, and examinations appropriate to obtain required **credentials** for a specific occupation.

   2.2 <u>Professional Traits and Labor Market:</u> Survey the range of **skills, competencies, and professional traits** required for careers in **public health and epidemiology** fields to current individual strengths and identify opportunities for personal development. Translate real-time and projected **labor market data** into narratives to identify local and national employment opportunities and determine **areas of growth** within public health and epidemiology fields.

3. **Legal and Ethical Issues**

   3.1 <u>Laws and Ethics:</u> Summarize and explain the **Americans with Disabilities Act of 1990** (ADA), the **American Hospital Association's** "Patient Bill of Rights," the **Omnibus Budget Reconciliation Act of 1990** (OBRA), and the **Patient Self-Determination Act of 1990** (PSDA) to a patient/client or classmate. **Highlight the rights of a patient or client**, depending on differences in age, mental status, and competency.

   3.2 <u>Patient Confidentiality:</u> Summarize the **Health Insurance Portability and Accountability Act** (HIPAA) within the context of mental health, infectious disease, and community health

treatment relating key provisions of the act to patient rights. Contrast **patient/client rights** with a community's right to know about dangerous mental health clients or persons with communicable diseases.

4. **Biostatistical Data**

   4.1 <u>Infection Control</u>: Distinguish between the terms endemic, epidemic, and pandemic. Analyze the **factors involved in the spread of disease**, such as the increase in world travel among socially mobile populations. Research **global initiatives** currently in place to prevent the spread of diseases/disorders such as influenza, COVID 19, or HIV/AIDS.

   4.2 <u>Social and Community Health:</u> Identify social and community health issues prevalent in a **specific community or region of the state**. Research **social determinants** impacting a specific health issue, including but not limited to:
       a. developmental stage,
       b. risk-taking behavior,
       c. race/ethnicity,
       d. environment,
       e. geography,
       f. social status,
       g. income,
       h. other factors that contribute to diseases and disorders, and
       i. compare and contrast the health of communities with different demographic data.

   4.3 <u>Data Interpretation and Communication:</u> Public health surveillance is a mechanism that public health agencies use to monitor the health of communities. Describe the **types of data commonly** collected by national health organizations and national government agencies, including the key parameters (i.e., fertility, life expectancy, infant mortality rates) most often reported in the analysis of public health. Demonstrate the ability to **interpret and communicate results** from public health surveillance analyses, applying basic statistical concepts such as measurements of central tendency (mean, median, mode), measurements of spread (range, variance, standard deviation), and changes over time.

   4.4 <u>Data driven Policy Change:</u> Evaluate how **biostatistical data** is used to identify national **health priorities, disparities, and epidemiological transitions**, and discuss how advances in public health surveillance have **changed the delivery of key healthcare services** (such as the need for family planning, vaccinations, or disease treatment). Furnish examples of data-driven policy changes informed by the collection and analysis of health surveillance data. For example, examine a case study of how the Centers for Disease Control responded to the 2014-16 Ebola outbreak and threat to the United States.

   4.5 <u>Disease and Disorders:</u> Examine the **epidemiologic, genetic, and/or biological basis** of at least one of the **diseases or disorders** in each of the areas listed below. Compare the prevalence of the disease/disorder across a **variety of populations and countries**. Determine the factors that contribute to higher or lower prevalence in a given population or area of the country.
       a. Infectious Diseases

b. HIV/AIDS
c. Neurodevelopment disabilities
d. Cancer
e. Cardiovascular Disease
f. Diabetes
g. Dementia

5. Emergency Allocation of Resources and Communication

5.1 <u>Request for Emergency Assistance Flow Chart:</u> Select public health risks and emergencies that impact healthcare delivery. Using Tennessee's Crisis Standards of Care, **create a flow-chart** of how local, state, and/or federal governments coordinate to **handle requests for emergency assistance** related to human resources, supplies/equipment, and medical countermeasures.

5.2 <u>Emergency Communication:</u> **Analyze emergency communication** using resources such as the Centers for Disease Control's Crisis Emergency Risk Communication plan. Identify **at risk population** groups that need **customized messaging** and healthcare delivery during emergencies due to disease specific needs, medical device needs, limited access to care/support, or language barriers. Discuss the needs of one specific group, citing local incidence information as compared to state, region, and national data. Include existing policies or plans that target the needs of the group, and healthcare interventions available.

6. Treatment

6.1 <u>Health Challenges:</u> Compare and contrast the **health challenges** characteristic of **urban and rural settings.** Analyze factors such as disease management, social and behavioral interventions, nutrition, service disparities, and availability of preventive measures like screenings. Debate the key challenges to the provision of services across the state.

6.2 <u>Epidemiologic Triad Charts and Rothman's Causal Pies:</u> An important aspect of the study of epidemiology is to identify factors that place certain populations at a higher risk for developing diseases and disorders. Compare and contrast the **two primary models of disease causation**: the **epidemiologic triad and Rothman's causal pies**. Demonstrate understanding by completing an **epidemiologic triad chart** and a **causal pie** for a variety of diseases and disorders.

6.3 <u>Mitigation of Disease:</u> Research the **mitigation of disease** severity through implementation of different types of interventions including **medical countermeasures** (antibiotics, vaccines) and **non-pharmaceutical interventions** (community mitigation steps). Develop a detailed **treatment plan** with goals and objectives, medical countermeasures, and non-pharmaceutical interventions for one of the health issues studied in this course. Cite specific textual evidence to defend elements of plan.

6.4 <u>Child/Infant Mortality:</u> Compare and contrast causes of **child/infant mortality** within the **first five years of life** in the Tennessee versus the United States. Identify **effective**

interventions for prevention of infant and childhood disorders, supporting recommendations with evidence-based medical or public health practice standards retrieved from a variety of sources.

7. **Final Project**

   7.1 Needs Assessment: Drawing on material learned in this course, conduct a **needs assessment** for **a target population in both rural and urban settings** affected by a health issue such as diabetes, cancer, HIV/AIDS, or other disease/disorder. Retrieve relevant health surveillance data related to the prevalence of the disease/disorder and the environmental and genetic factors that contribute to the problem. Synthesize research on existing policies, programs, and initiatives currently or formerly in place to alleviate the problem, and compile the results of the needs assessment into a written report supported by graphical and statistical aids.

   7.2 Needs Assessment Recommendations: Building off the needs assessment conducted in standard 7.1, **create a plan to address the needs of the target population**. Consider a range of potential policy solutions, weighing the costs and benefits of each, including the obstacles to implementation. Then advance a recommendation for one of the solutions, outlining a strategy to engage the appropriate agencies, decision-makers, and other stakeholders.

The following artifacts will reside in the student's portfolio:
   a. Standard 5.1 Request for emergency assistance flow chart
   b. Standard 6.2 Epidemiologic triad charts and Rothman's Causal Pies
   c. Standard 7.1 Needs Assessment
   d. Standard 7.2 Needs Assessment Recommendations

Standards Alignment Notes

*References to other standards include:
- P21: Partnership for 21st Century Skills [Framework for 21st Century Learning](#)
  - Note: While not all standards are specifically aligned, teachers will find the framework helpful for setting expectations for student behavior in their classroom and practicing specific career readiness skills.