Texas CTE: Health Science

World Health and Emerging Technologies

Implementation. A

1 The provisions of this section shall be implemented by school districts beginning with the 2024- 2025 school year. A.1

2 School districts shall implement the employability skills student expectations listed in §127.15(d)(2) of this chapter (relating to Career and Technical Education Employability Skills) as an integral part of this course. A.2

General requirements. This course is recommended for students in Grades 11 and 12. Prerequisites: one credit in biology and at least one credit in a Level 2 or higher course from the health science career cluster. Students shall be awarded one credit for successful completion of this course. B

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Introduction. C

1 Career and technical education instruction provides content aligned with challenging academic standards, industry-relevant technical knowledge, and college and career readiness skills for students to further their education and succeed in current and emerging professions. C.1

2 The Health Science Career Cluster focuses on planning, managing, and providing therapeutic services, diagnostic services, health informatics, support services, and biotechnology research and development. C.2

3 The World Health and Emerging Technologies course is designed to examine major world health problems and emerging technologies as solutions to these medical concerns. It is designed to improve students' understanding of cultural, infrastructural, political, educational, and technological constraints and inspire ideas for appropriate technological solutions to global medical care issues. C.3

4 **Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other organizations that foster leadership and career development in the profession such as student chapters of related professional associations.** C.4

5 **Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.** C.5

Knowledge and skills. D

1 **The student explores and discusses current major human health problems in the world. The student is expected to:** D.1

- A describe the pathophysiology of the three leading causes of death in developing and developed countries; D.1
- B discuss history of diseases and the evolution of medical technology over time; D.1
- C contrast health problems in developing and developed countries; D.1
- D compare the functions of public health organizations, including the Centers for Disease Control and Prevention (CDC) and World Health Organization (WHO), at the local, state, national, and international levels; D.1
- E define and calculate incidence, morbidity, and mortality; D.1
- F identify and describe the challenges in global health that can have the greatest impact on health in developing nations; and D.1
- G investigate various social determinants of health such as food insecurity, homelessness, or financial insecurities. D.1

2 **The student explains who pays for health care in the world today. The student is expected to:** D.2

- A compare the availability and quality of health care in developing and developed countries; D.2
- B discuss and contrast the four basic healthcare system models, including the Beveridge Model, Bismarck Model, National Health Insurance Model, and the Out-of-Pocket Model, and compare these models to existing payment mechanisms in the United States of America; D.2
- C explain how countries that have different healthcare systems such as Canada, the United Kingdom, Japan, Germany, Taiwan, Switzerland, and the United States of America pay for health care and compare their patient outcomes such as infant mortality rates, rate of cancer, or rate of heart disease; D.2
- D describe how healthcare expenditures have changed over time; and D.2
- E identify the major contributors to the rising healthcare industry costs. D.2

3 **The student describes the engineering technologies developed to address clinical needs. The student is expected to:** D.3

- A describe technologies that support the prevention and treatment of infectious diseases; D.3
- B explain the implication of vaccines on the immune system and on public health; D.3
- C discuss the dangers of antibiotic overuse and misuse; D.3
- D investigate technologies such as genetics and molecular diagnostics used for the early detection and treatments of several types of cancers; D.3
- E describe and discuss the technologies used in the diagnosis and treatment of heart disease; D.3
- F describe and discuss technologies developed to support vital organ failure; and D.3
- G investigate emerging digital technology such as telehealth and remote monitoring and its impact on healthcare delivery. D.3

4 **The student explores how human clinical trials are designed, conducted, and evaluated. The student is expected to:** D.4

- A describe and discuss types of clinical trials, including the role of the institutional review board; D.4
- B define and calculate a sample size; D.4
- C identify quantitative and qualitative methods used in clinical trials; and D.4
- D compare and contrast different phases of pharmaceutical trials. D.4

5 **The student recognizes the ethical and legal aspects involved in clinical research. The student is expected to identify issues and explain the ethical and legal guidelines, including informed consent and patient confidentiality, for the conduct of research involving human subjects.** D.5

6 **The student explains how research guides the development of new medical technologies. The student is expected to:** D.6

- A describe how health science research is funded; D.6
- B explain the role of the U.S. Food and Drug Administration in approving new drugs and medical devices; and D.6
- C analyze factors that affect the dissemination of new medical technologies. D.6

7 **The student applies research principles to create a project that addresses a major health topic. The student is expected to:** D.7

- A facilitate data analysis and communicate experimental results clearly by effectively using technology such as creating visual aids; and D.7
- B present the project to classmates, health professionals, parents, or instructors. D.7