# Scope & Sequence

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| Course Name: Pathophysiology **PEIMS Code:** 13020800 | | | **Course Credit:** 1.0  **Course Requirements:** This course is recommended for students in Grades 11 and 12.  **Prerequisites:** Biology and Chemistry.  **Recommended Prerequisite:** A course from the Health Science Career Cluster. |
| **Course Description:** The Pathophysiology course is designed for students to conduct laboratory and field investigations, use scientific methods during investigations, and make informed decisions using critical thinking and scientific problem solving. Students in Pathophysiology will study disease processes and how humans are affected. Emphasis is placed on prevention and treatment of disease. Students will differentiate between normal and abnormal physiology. | | | |
| **NOTE:** This is a suggested scope and sequence for the course content. This content will work with any textbook or instructional materials. If locally adapted, make sure all TEKS are covered. | | | |
| **Total Number of Periods**  **Total Number of Minutes**  **Total Number of Hours** | 175 Periods  7,875 Minutes  131.25 Hours\* | \*Schedule calculations based on 175/180 calendar days. For 0.5 credit courses, schedule is calculated out of 88/90 days. Scope and sequence allows additional time for guest speakers, student presentations, field trips, remediation, extended learning activities, etc. | |
| **Unit Number, Title, and Brief Description** | **# of Class Periods\***  (assumes 45-minute periods)  Total minutes per unit | **TEKS Covered**  **130.227 (c)** **Knowledge and skills** | |
| **Unit 1: Meeting Employer Expectations in Health Science**  This unit is designed to inform future Health Science students about industry expectations for employability skills and professional standards. | 15 periods  675 minutes | (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:  (A) demonstrate verbal and non-verbal communication in a clear, concise, and effective manner; and  (B) exhibit the ability to cooperate, contribute, and collaborate as a member of a team. | |
| **Unit 2: Laboratory and Field Investigation in Health Science**  In this unit students understand how to safely and effectively use laboratory equipment. Student will demonstrate ethical and environmentally appropriate practices during laboratory and field investigations. Students should be able analyze data with both physical equipment and with experimentation that extends beyond the classroom. | 15 periods  675 minutes | (2) The student, for at least 40% of instructional time, conducts field and laboratory investigations using safe, environmentally appropriate, and ethical practices. These investigations must involve actively obtaining and analyzing data with physical equipment, but may also involve experimentation in a simulated environment as well as field observations that extend beyond the classroom. The student is expected to:  (A) demonstrate safe practices during laboratory and field investigations; and  (B) demonstrate an understanding of the use and conservation of resources and the proper disposal or recycling of materials. | |
| **Unit 3: The Use of Scientific Theory in Health Science**  The scientific theory is a foundation of health science. Student in this unit will distinguish between scientific hypotheses and scientific theories and also collect and organize qualitative and quantitative data and make measurements with accuracy and precision using a variety of scientific tools. Students will also demonstrate the ability to communicate valid conclusions supported by the data through a variety of methods. Students are also expected to describe proper methods of disposing of biohazard material and to display standard precautions, including proper protective equipment during all laboratory exercises. | 20 periods  900 minutes | (3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:  (A) know the definition of science and understand that it has limitations, as specified in subsection (b)(4) of this section;  (B) know that hypotheses are tentative and testable statements that must be capable of being supported or not supported by observational evidence. Hypotheses of durable explanatory power that have been tested over a variety of conditions are incorporated into theories;  (C) know that scientific theories are based on natural and physical phenomena and are capable of being tested by multiple independent researchers. Unlike hypotheses, scientific theories are well-established and highly-reliable explanations, but they may be subject to change as new areas of science are created and new technologies emerge;  (D) distinguish and differentiate between scientific hypothesis and scientific theories;  (E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology;  (F) collect and organize qualitative and quantitative data and make measurements with accuracy and precision using tools such as calculators, spreadsheet software, data-collecting probes, computers, standard laboratory glassware, microscopes, various prepared slides, stereoscopes, metric rulers, electronic balances, gel electrophoresis apparatuses, micropipettors, hand lenses, Celsius thermometers, hot plates, lab notebooks or journals, timing devices, Petri dishes, lab incubators, dissection equipment, meter sticks, and models, diagrams, or samples of biological specimens or structures;  (G) analyze, evaluate, make inferences, and predict trends from data; and  (H) communicate valid conclusions supported by the data through methods such as lab reports, labeled drawings, graphic organizers, journals, summaries, oral reports, and technology-based reports | |
| **Unit 4: Critical Thinking Skills in Health Science**  Students will learn to use the scientific method, critical thinking, and problem solving to make informed decisions in health science. Students will evaluate scientific models, research, and the impact of scientific research on society and the environment. Students will analyze, evaluate, and critique scientific explanations to encourage critical thinking. | 15 periods  675 minutes | (4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:  (A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking;  (B) communicate and apply scientific information extracted from various sources such as accredited scientific journals, institutions of higher learning, current events, news reports, published journal articles, and marketing materials;  (C) draw inferences based on data related to promotional materials for products and services;  (D) evaluate the impact of scientific research on society and the environment;  (E) evaluate models according to their limitations in representing biological objects or events; and  (F) research and describe the history of science and contributions of scientists. | |
| **Unit 5: The Mechanisms of Pathology**  In this unit students will explore biological and chemical process at the cellular level. Multiple factors that contribute to disease including age, gender, environment, lifestyle, and heredity are analyzed. Students will examine cells and tissues looking for signs of mutations and neoplasms. The body’s attempt to compensate and maintain homeostasis is also explained. | 25 periods  1,125 minutes | (5) The student analyzes the mechanisms of pathology. The student is expected to:  (A) identify biological and chemical processes at the cellular level;  (B) detect changes resulting from mutations and neoplasms by examining cells, tissues, organs, and systems;  (C) identify factors that contribute to disease such as age, gender, environment, lifestyle, and heredity;  (D) examine the body's compensating mechanisms occurring under various conditions; and  (E) analyze how the body attempts to maintain homeostasis when changes occur. | |
| **Unit 6: The Processes of Pathogenesis**  In this unit students will examine the ways diseases develop and analyze the body’s natural defenses against them. Students will describe different stages of pathogenesis and research stages in the progression of disease. Chemical agents, environmental pollution, and trauma on the disease process will be analyzed. | 25 periods  1,125 minutes | (6) The student examines the process of pathogenesis. The student is expected to:  (A) identify pathogenic organisms using microbiological techniques;  (B) differentiate the stages of pathogenesis, including incubation period, prodromal period, and exacerbation or remission;  (C) analyze the body's natural defense systems against infection such as barriers, the inflammatory response, and the immune response;  (D) evaluate the effects of chemical agents, environmental pollution, and trauma on the disease process; and  (E) research stages in the progression of disease. | |
| **Unit 7: Common Human Diseases**  The nature of common diseases including advanced technologies for the diagnosis and treatment are the focus of this unit. Some diseases, thought to be cured, are making a reemergence as antibiotic-resistance diseases are being discovered. Students will differentiate between congenital disorders and childhood diseases as they investigate ways diseases affect multiple body systems. | 30 periods  1,350 minutes | (7) The student examines a variety of human diseases. The student is expected to:  (A) describe the nature of diseases, including the etiology, signs and symptoms, diagnosis, prognosis, and treatment options for diseases;  (B) explore advanced technologies for the diagnosis and treatment of disease;  (C) examine reemergence of diseases such as malaria, tuberculosis, and polio;  (D) differentiate between hospital-acquired infections and community-acquired infections;  (E) examine antibiotic-resistant diseases such as methicillin resistant *Staphylococcus aureus*;  (F) differentiate between congenital disorders and childhood diseases; and  (G) investigate ways diseases affect multiple body systems | |
| **Unit 8: Disease Prevention and Control**  Students in this unit will examine how disease prevention and control influence both personal and public health. Developing world health issues are identified and possible ways to cope with them. Public health issues related asepsis, isolation, immunization, and quarantine are analyzed. A personal wellness and health plan will be developed along with and understanding of how stress and aging affects the human body. | 30 periods  1,350 minutes | 8) The student integrates the effects of disease prevention and control. The student is expected to:  (A) evaluate public health issues related to asepsis, isolation, immunization, and quarantine;  (B) analyze the effects of stress and aging on the body;  (C) evaluate treatment options for diseases;  (D) investigate diseases that threaten world health and propose intervention strategies; and  (E) develop a plan for personal health and wellness. | |