Principles of Diagnostic Healthcare

PEIMS Code: N1302106
Abbreviation: DIGHLTH
Grade Level(s): 9–10
Award of Credit: 1.0

State Approved Innovative Course

- Districts must have local board approval to implement innovative courses.
- In accordance with Texas Administrative Code (TAC) §74.27, school districts must provide instruction in all essential knowledge and skills identified in this innovative course.
- Innovative courses may only satisfy elective credit toward graduation requirements.
- Please refer to TAC §74.13 for guidance on endorsements.

Course Description:

The *Principles of Diagnostic Healthcare* course is designed to provide students with an overview of the education and career opportunities in this rapidly growing and significant sector of health care. Students will be provided with experiential learning activities in clinical diagnostic applications while building the knowledge and skills needed to investigate and analyze disease processes. This course is designed to foster student interest and allow for exploration of diagnostic healthcare professions and industry-based certifications. The goal is to prepare students for 21st-century careers and with an emphasis on the development of knowledge, understanding, and application of science, biology, technology, and mathematical skills. Clinical diagnostic careers require students to generate intellectual inquiry, entice critical thinking, and use problem-solving and analytical skills that will lead to data-driven decisions. Areas of concentration will include laboratory sciences, digital radiography, nuclear medicine, electrocardiograms (EKGs) and ophthalmic technologies.

Essential Knowledge and Skills:

(a) General Requirements. This course is recommended for students in Grades 9 and10. Students shall be awarded one credit for successful completion of this course.

(b) Introduction.

(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.

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

(3) The Principles of Diagnostic Healthcare course is designed to provide students with an overview of the education and career opportunities in this rapidly growing

and significant sector of health care. Students will be provided with experiential learning activities in clinical diagnostic applications while building the knowledge and skills needed to investigate and analyze disease processes. This course is designed to foster student interest and allow for exploration of diagnostic healthcare professions and industry-based certifications. The goal is to prepare students for 21st-century careers and with an emphasis on the development of knowledge, understanding, and application of science, biology, technology, and mathematical skills. Clinical diagnostic careers require students to generate intellectual inquiry, entice critical thinking, and use problem-solving and analytical skills that will lead to data-driven decisions. Areas of concentration will include laboratory sciences, digital radiography, nuclear medicine, electrocardiograms (EKGs) and ophthalmic technologies.

(4) To pursue a career in the health science industry, students should learn to reason, think critically, make decisions, solve problems, and communicate effectively. Students should recognize that quality health care depends on the ability to work well with others.

(5) Professional integrity in the health science industry is dependent on acceptance of ethical and legal responsibilities. Students are expected to employ their ethical and legal responsibilities, recognize limitations, and understand the implications of their actions.

(6) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.

(7) 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) Knowledge and Skills.

(1) The student demonstrates professional standards/employability skills as required by the diagnostic healthcare industry. The student is expected to:

(A) analyze information and use logic to address work-related issues and problems in a diagnostic healthcare environment;

(B) use critical thinking skills to solve problems in a diagnostic healthcare environment such as patient testing or trouble shooting examination results;

(C) identify employer expectations such as punctuality, attendance, time management, organizational skills, and productive work habits;

(D) explain the importance of attention to detail in completing work tasks;

(E) define dependability, being responsible, and fulfilling obligations;

(F) demonstrate integrity by being honest and ethical in a professional environment;

(G) demonstrate cooperative skills such as being pleasant with others, a positive attitude, and being sensitive to others' needs and feelings;

(H) define constructive criticism;

(I) identify the steps to maintaining composure and dealing with high-stress situations calmly and effectively;

(J) discuss the importance of adaptability and flexibility in a job that requires being receptive to change (positive or negative) in the workplace;

(K) demonstrate initiative to take on responsibilities and being persistent in the face of challenges and obstacles;

(L) display independence by guiding oneself with little or no supervision to complete tasks;

(M) describe innovation with creativity and alternative thinking to develop new ideas and answers to problems; and

(N) explain the importance of goal setting in the professional environment.

(2) The student applies mathematics, science, and English language arts in health science. The student is expected to:

(A) use mathematics, such as conversions, measurements, statistics, to solve healthcare-related problems;

(B) interpret graphs and data to compile, categorize, calculate, and process healthcare diagnostic information;

(C) describe biological and chemical processes that maintain homeostasis;

(D) list the functions organisms, tissues, and cells including interdependencies and interactions with each other and the environment;

(E) identify safety protocols concerning the use of chemicals such as interactions and disposal methods;

(F) employ standard safety precautions including proper protective equipment during all laboratory exercises;

(G) use scientific rules and methods to solve problems; and

(H) use the structure and content of the English language including the meaning and spelling of words, rules of composition, and grammar and understanding written sentences and paragraphs in work-related documents.

(3) The student uses verbal and nonverbal communication skills in a professional manner. The student is expected to:

(A) use active listening to show attentiveness to what other people are saying, understanding of the points being made, asking questions as appropriate, and not interrupting at inappropriate times;

(B) formulate responses using professional tone and language to effectively communicate ideas;

(C) identify professional communication skills via telephone, written form, e-mail, or in-person in the work setting;

(D) evaluate the effectiveness of conflict-resolution techniques in various situations; and

(E) identify diverse and cultural influences that have impacted contemporary aspects of health care delivery and demonstrate effective communication skills for responding to the needs of individuals in a diverse society.

(4) The student assesses career options and the preparation necessary for employment in the diagnostic healthcare industry. The student is expected to:

(A) locate, evaluate, and interpret career options and employment information;

(B) identify academic requirements for certification, licensure, registration, continuing education, and advanced degrees;

(C) discuss the impact of career decisions, including advancement opportunities; and

(D) examine the role of professional organizations in the preparation and governance of credentialing and certification.

(5) The student examines the role of the multidisciplinary team in providing healthcare. The student is expected to:

(A) explain the concept of teaming to provide quality health care; and

(B) exhibit the ability to cooperate, contribute, and collaborate as a member of a team.

(6) The student interprets ethical behavioral standards and legal responsibilities. The student is expected to:

(A) compare published professional codes of ethics and scope of practice;

(B) explain principles of ethical behavior and confidentiality including the consequences of breach of confidentiality;

(C) discuss ethical issues related to diagnostic healthcare, including implications of technological advances; and

(D) examine issues related to malpractice, negligence, and liability as related to licensed professionals.

(7) The student recognizes the importance of maintaining a safe environment and eliminating hazardous situations. The student is expected to:

(A) identify governing regulatory agencies such as the Centers for Disease Control and Prevention, Occupational Safety and Health Administration, U.S. Food and Drug Administration, Joint Commission, and other accrediting agencies; and

(B) identify industry safety standards such as standard precautions, universal precautions, radiation protection practices, fire prevention and safety practices, and appropriate actions to emergency situations in the diagnostic healthcare industry.

(8) The student identifies the equipment and technology used in the diagnostic healthcare system. The student is expected to:

(A) identify current technological equipment used in the various diagnostic fields;

(B) discuss the role of routine equipment maintenance to ensure proper performance;

(C) list troubleshooting activities used to determine causes of operating errors and decide on a course of action;

(D) identify basic microscope parts and their operating functions according

to proper microscope procedures; and

(E) explain the health information system's role in healthcare and the various software applications related to diagnostic departments.

(9) The student identifies concepts of required knowledge for careers in diagnostic healthcare. The student is expected to:

(A) identify diseases and clinical significance of bloodborne pathogens;

(B) analyze the basic relationships between the anatomical structures and physiological functions;

(C) evaluate the cause and effect of common diseases such as diabetes, cancer, cardiovascular disease and infectious diseases;

(D) examine trauma and congenital defects as they affect the structure and function of cells, tissues, organs in body systems;

(E) identify the information, testing procedures and techniques needed to diagnose human injuries, diseases, and deformities; and

(F) identify occupational specific terms and abbreviations such as those relating to the body systems, diseases, and diagnostic procedures.

Recommended Resources and Materials:

Linne & Ringsrud's Clinical Laboratory Science, 8th Edition (2020).

Center for the Advancement of Process Technology (CAPT}. (2010). Safety, Health and Environment. Pearson.

Callaway, W. J. (2020). Introduction to radiologic technology. St. Louis, MO: Elsevier.

Recommended Course Activities:

- Read and report on trending diagnostic healthcare topics, such as current events
- Write answers to discussion questions about ethical issues in diagnostic healthcare
- Give an oral presentation on governing regulatory agencies that affect diagnostic healthcare professions
- Use critical thinking skills in the application of safety procedures to ensure the safety of themselves as well as peers
- Learn the importance and demonstrate professional communications through role play
- Use computer technology in the research and preparation of multimedia presentations
- Complete career interest inventories and career pathway planning
- Invite guest speakers
- Use simulation lab experiences

Suggested methods for evaluating student outcomes:

Student outcomes may be evaluated through a variety of methods, including classroom assignments, performance rubrics, lab assignments, research, individual and group projects, quizzes, tests and final exam.

Teacher qualifications:

An assignment for Principles of Diagnostic Healthcare is allowed with one of the following certificates.

- Health Science: Grades 6-12.
- Health Science Technology Education: Grades 8-12.
- Vocational Health Occupations.
- Vocational Health Science Technology.

Additional information: