Texas CTE: Health Science

Pharmacology

Implementation. A

1 The provisions of this section shall be implemented by school districts beginning with the 2023- 2024 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, one credit in chemistry, 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

b General requirements. This course is recommended for students in Grades 11 and 12. Prerequisites: one credit in biology, one credit in chemistry, 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

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 Pharmacology course is designed to study how natural and synthetic chemical agents such as drugs affect biological systems. Knowledge of the properties of therapeutic agents is vital in providing quality health care. It is an ever-changing, growing body of information that continually demands greater amounts of time and education from healthcare workers. 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 the field and foundation of pharmacology. The student is expected to:** D.1

- A differentiate between pharmacology subdivisions, including pharmacodynamics, pharmacokinetics, pharmaceutics, and pharmacotherapeutics; D.1.A
- B use common drug information materials such as accredited scientific journals, institutions of higher learning, current events, news reports, published journal articles, textbooks, and marketing materials; D.1.B
- C list examples of primary, secondary, and tertiary drug information references; D.1.C
- D research and describe the history of pharmacy and contributions of the field; D.1.D
- E draw inferences based on data from promotional materials for products and services; D.1.E
- F analyze the societal impact of medication costs; and D.1.F
- G evaluate the impact of scientific research on society, including drug development and the natural environment, including drug disposal. D.1.G

2 **The student identifies careers associated with pharmacology. The student is expected to:** D.2

- A evaluate career pathways utilizing pharmacology; D.2.A
- B define the role of the pharmacy team; and D.2.B
- C research and describe emerging opportunities within the pharmacy profession. D.2.C

3 **The student explains the ethical and legal responsibilities associated with pharmacology. The student is expected to:** D.3

- A explain the causes, effects, and consequences associated with medical errors, including medication errors; D.3.A
- B define legal terminology associated with medical errors such as negligence, product liability, contributory negligence, and regulatory law; D.3.B
- C analyze the principles of medical ethics, including beneficence, autonomy, maleficence, and justice; and D.3.C
- D evaluate professional liability. D.3.D

4 **The student uses medical terminology to communicate effectively with other healthcare professionals, patients, and caregivers. The student is expected to:** D.4

- A use the appropriate medical terminology to identify different classes of drugs; D.4.A
- B communicate using medical terminology associated with pharmacology; D.4.B
- C analyze unfamiliar terms using the knowledge of word roots, suffixes, and prefixes; and D.4.C
- D interpret medical terminology to communicate with patients and caregivers. D.4.D

5 **The student demonstrates mathematical knowledge and skills to solve problems with systems of measurement used in the pharmacy. The student is expected to:** D.5

- A calculate medication dosages using formulas, ratios, proportions, and allegations; D.5.A
- B convert a measurement expressed in one standard unit within a system to a measurement expressed in another unit within the same system; D.5.B
- C convert a measurement expressed in one system to a unit of the same measurement in a different system, including metric, apothecary, avoirdupois, and household systems; and D.5.C
- D evaluate statistical data and its limitations such as patient compliance, study design, and controls. D.5.D

6 **The student evaluates pharmaceutical agents, their dosage form, and routes of administration. The student is expected to:** D.6

- A analyze the availability of different dosage forms such as solid, liquid, patch, and IV solution; D.6.A
- B give examples of the brand or generic names of drugs such as the top 200 drugs in each dosage form and routes of drug administration; D.6.B
- C define medical terminology associated with drug dosage forms; D.6.C
- D explain the difference between therapeutic effects, side effects, and toxic effects; D.6.D
- E identify the mechanism of action of different drug classifications such as drug receptors, agonists, and antagonist relationships; D.6.E
- F explain the dose response relationship concept such as the difference between oral and IV administration of drugs and explain the relationship between drug dosage, drug response, and time; and D.6.F
- G explain drug safety practices such as monitoring expiration dates and drug disposal. D.6.G

7 **The student demonstrates knowledge and use of appropriate equipment, instruments, and technology. The student is expected to:** D.7

- A identify technology components used in the pharmacy workflow such as ordering, entering, filling, and dispensing; D.7.A
- B describe how technology applications improve efficiency in the pharmacy; and D.7.B
- C identify and demonstrate proper use and maintenance of equipment and instruments used in a pharmacy setting such as IV drop sets, scales, glucose supplies, dispensing units or cabinets, and other laboratory supplies. D.7.C

8 **The student practices safe protocols in preventing personal and client illness or injury. The student is expected to:** D.8

- A employ safety standards such as workplace standards; D.8.A
- B interpret and apply pharmacy standards according to the strictest local, state, or federal regulations to enhance safety; D.8.B
- C examine the consequences of unsafe practices; and D.8.C
- D demonstrate safe procedures in the administration of client care in a simulated or clinical setting. D.8.D