



Science of Nursing

PEIMS Code: N1302129

Abbreviation: SCINURS

Grade Level(s): 10-11

Award of Credit: 1.0

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 Science of Nursing course introduces students to basic research-based concepts in nursing. Topics include the nursing process, the importance of critical thinking to patient care, regulatory agencies, and professional organizations. Instruction includes skills needed to pursue a nursing degree and training requirements required for specialty nursing roles. Knowledge and skills learned will include emergency care, patient assessment, basic interpretation of vital signs, identification of patients with physical and mental disabilities, patient positioning, use of assistive devices, and application of nursing theories in patient care plans.

Essential Knowledge and Skills:

- (a) General Requirements. This course is recommended for students in grades 10-11. Recommended prerequisite: Principles of Nursing Science or Principles of Health Science. 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, diagnostic services, health informatics, support services, and biotechnology research and development.
 - (3) The Science of Nursing course introduces students to basic research-based concepts in nursing. Topics include the nursing process, the importance of critical thinking to patient care, regulatory agencies, and professional organizations. Instruction includes skills needed to pursue a nursing degree and training requirements required for specialty

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nursing roles. Knowledge and skills learned will include emergency care, patient assessment, basic interpretation of vital signs, identification of patients with physical and mental disabilities, patient positioning, use of assistive devices, and application of nursing theories in patient care plans. 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.

- (4) 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.
- (5) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.
- (6) 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 business and industry. The student is expected to:
 - (A) apply appropriate verbal and non-verbal communication in a clear, concise, and effective manner;
 - (B) apply appropriate adaptability skills such as problem solving and creative thinking;
 - (C) create or evaluate a career plan using career exploration methods such as identifying educational pathways, developing career goals, and assessing individual aptitudes;
 - (D) demonstrate teamwork;
 - (E) create an occupation-specific resume; and
 - (F) identify and demonstrate soft skills valued by employers.
- (2) The student understands the tiers of nursing careers and the associated licensures. The student is expected to:
 - (A) describe the entry-level patient care technician (PCT) certification and common work settings such as hospitals, doctor's offices, and health care agencies for patient care technicians;
 - (B) list qualifications to become a certified nursing assistant (CNA) and the scope of practice for a CNA in a long-term care facility;
 - (C) define unlicensed assistant personnel (UAP) and how UAPs assist individuals with physical disabilities, mental impairments, and other healthcare needs;
 - (D) discuss course work required to obtain nursing credentials, including a licensed vocational nurse (LVN), associate degree nurse - registered nurse (ADN RN), and Bachelor of Science - registered nurse (BSN RN);
 - (E) review the requirements for advanced practice registered nurse (APRN), including certified registered nurse anesthetist (CRNA), certified nurse midwife

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- (CNM), certified nurse practitioner (CNP), and certified clinical nurse specialist (CNS); and
- (F) research nursing specialty options, including pediatric nursing, critical care nursing, emergency room nursing, mental health nursing, forensic nursing, geriatric nursing, nursing roles in education, and hospice nursing roles.
- (3) The student understands how the nursing process is used to collect subjective and objective data in patient assessment. The student is expected to:
- (A) describe the steps of a basic patient intake interview, including recording family history, biographical information, reason for seeking health care, present illness or health concerns, past health history, current medication list, and review of systems;
- (B) explain the visual and physical head-to-toe assessment used to evaluate patient condition, including abnormal and normal structure and function of the body systems;
- (C) identify and describe the importance of patient vital signs, including temperature, blood pressure, heart rate, respiratory rate, pulse oximetry, and pain;
- (D) identify equipment used to measure and record patient vital signs, including a thermometer, sphygmomanometer, stethoscope, pulse oximeter, and time keeping device;
- (E) compare patient vital signs that establish baseline homeostasis, including values outside of normal ranges;
- (F) discuss wellness versus illness related to human growth and development including factors related to race, gender, identity, and culture; and
- (G) evaluate how the steps in the nursing process are used to assist the patient to reach optimal physiological, social, mental, emotional, spiritual, cultural, and environmental wellness.
- (4) The student demonstrates knowledge of therapeutic care by reviewing patient activities of daily living. The student is expected to:
- (A) define the activities of daily living such as dressing and undressing, bathing, oral care, toileting, feeding, and transferring;
- (B) identify mental health disabilities such as depression, anxiety, and disorientation or social economic limitations such as domicile insecurities, food insecurities and low socioeconomic status experienced by patients;
- (C) evaluate physical disabilities and limitations such as loss of limbs, multiple sclerosis, spina bifida, cerebral palsy, spinal cord injuries, musculoskeletal injuries, visual impairment, hearing impairment, and rheumatoid arthritis to recommend the correct assistive device for patient care; and
- (D) relate therapeutic care to specific deficiencies in activities of daily living such as performing personal care, ambulation, reality orientation, and using of assistive devices.
- (5) The student understands the role of the nurse in providing first aid and emergency care. The student is expected to:

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- (A) compare first aid and emergency care certifications such as Basic Life Support (BLS), Automated External Defibrillator (AED), First Aid, and Mental Health First Aid;
- (B) discuss the advantages of obtaining first aid and emergency care certifications;
- (C) demonstrate first aid and emergency care skills used by nurses in a simulated environment; and
- (D) evaluate the role of a nurse in an emergency setting such as an emergency room, intensive care unit, urgent care, or responding to a life-saving event.
- (6) The student applies nursing theory to simulate the implementation of patient care. The student is expected to:
- (A) identify and explain the purpose of medical equipment that is used to assist patients with diverse needs, including a Hoyer lift, hospital beds, foley catheter and drainage system, wheelchairs, gait belts, and bedside commodes;
- (B) evaluate patient care needs throughout the lifespan using theories such as Maslow's Hierarchy of Needs, Erik Erikson's Stages of Psychosocial Development, Jean Piaget's Theory of Child Development, and Lev Vygotsky's Contemporary Theories on Development;
- (C) identify proper patient positioning for patient needs, including Trendelenburg, Fowlers, Supine, Prone, Lithotomy, and Lateral Recumbent;
- (D) analyze methods to educate patients, family members, or caregivers in techniques for managing disabilities or illnesses and using medical devices in an outpatient setting; and
- (E) model the use of medical equipment that assists patients in various healthcare settings, including long-term care facilities, nursing and rehabilitation facilities, home health care settings, classroom, or simulated environment.
- (7) The student knows how to use technology as it pertains to nursing practice. The student is expected to:
- (A) identify and describe the technology used to collect patient information, including electronic medical records, mobile computer workstations, scanning devices, and charting software;
- (B) describe where to access laboratory values and normal ranges for diagnostic tests such as complete blood count, comprehensive metabolic panel, basic metabolic panel, and urinalysis to determine patient health status; and
- (C) describe how advancements in technology, including remote patient monitoring systems, wearable monitoring systems, electronic intake patient interviews, interpreting services, deaf-link communication services, and patient safety alarms, can improve quality of care.
- (8) The student understands the importance of using critical thinking skills in the nursing process. The student is expected to:
- (A) analyze the components of conducting a comprehensive patient assessment;
- (B) differentiate between subjective and objective data, including what the patient reports and what is observable and quantifiable;

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- (C) compare trends in health outcomes among diverse populations across the lifespan including birth rates, life expectancy, mortality rates, and morbidity rates;
 - (D) interpret medical research using peer-reviewed articles to review efficacy in patient care;
 - (E) create a patient care plan using procedures such as assess, diagnose, plan, implement and evaluate (ADPIE) and subjective, objective, assess, plan, implement, and evaluate (SOAPIE);
 - (F) assess the impact of nursing interventions on patient condition in a simulated setting; and
 - (G) examine clinical outcomes based upon patient assessment, care plan, and nursing interventions.
- (9) The student understands pharmacology terminology associated with nursing practices. The student is expected to:
- (A) describe the eight rights of medication administration, including right patient, medication, dose, route, time, documentation, reason, and response;
 - (B) describe the effects of medication on the human body system, including pharmacodynamics;
 - (C) explain pharmacokinetics in the human body system such as the course of drug absorption, distribution, metabolism, and excretion; and
 - (D) analyze the advantages and disadvantages of various routes of drug administration, including oral, injection, topical, buccal, suppository, mucosal, intravenous, interosseous, nebulization, and intrathecal.

Recommended Resources and Materials:

Boyer, Mary Jo. *Math for Nurses: A Pocket Guide to Dosage Calculation and Drug Preparation*. Philadelphia: Walters Kluwer, 2020.

Dirksen, Shannon Ruff., Sharon L. Lewis, Margaret McLean. Heitkemper, and Linda Bucher. *Medical-Surgical Nursing: Assessment and Management of Clinical Problems*. St Louis, MO: Elsevier Mosby, 2011.

Freedman, Jeri. *Jump-Starting a Career in Nursing*. New York: Rosen YA, 2019.

Lewis, Sharon Mantik., Linda Bucher, Margaret McLean. Heitkemper, Mariann Harding, Jeffrey Kwong, and Dottie Roberts. *Medical Surgical Nursing: Assessment and Management of Clinical Problems*. St. Louis: Elsevier, 2017.

Kee, Joyce LeFever. *Laboratory and Diagnostic Tests with Nursing Implications*. New York: Pearson, 2018.

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Kizior, Robert J., Barbara B. Hodgson, Keith J. Hodgson, and James B. Witmer. *Nursing Drug Handbook* 2016. St. Louis, MO: Elsevier, 2016.

Perry, Anne Griffin, Patricia A. Potter, and Wendy Ostendorf. *Clinical Nursing Skills & Techniques*. St Louis: Mosby, 2017.

Springhouse. *Lippincott Manual of Nursing Practice*. Philadelphia: Wolters Kluwer Health, 2014.

Taylor, Tracy A. *Fundamentals of Nursing Made Incredibly Easy!* Philadelphia, PA: Wolters Kluwer, 2015.

Van Leeuwen, Anne M. and Mickey Lynn Bladh. *Davis's Comprehensive Handbook of Laboratory & Diagnostic Tests with Nursing Implications*. Philadelphia: F.A. Davis Company, 2019.

Recommended Course Activities:

- Assigned reading
- Interactive simulation
- Guest nurse speaker/Testimonial
- Cardiopulmonary resuscitation training-American Heart Association
- Research projects related to professional nursing
- Patient charting and intake of medical history
- Role play
- Review journals and articles

Suggested methods for evaluating student outcomes:

- Concept mapping ("Concept maps are useful to demonstrate analysis, synthesis, and prioritization. They require the student to have a global grasp of a situation with synthesis of new and old knowledge rather than just remembering.")
- Research presentation ("Presentations evaluate achievement of objectives in the cognitive and affective domains...student learning when doing a presentation begins with a search for pertinent literature. This reinforces how to do a literature search, evaluate the quality of the evidence, and select what is important enough to share with peers. ")
- Simulation scenarios of clinical situations
- Performance of aseptic technique in simulated environments
- Simulation of activities of daily living (ADL) for patient care settings
- Weekly reflective journal
- Exams

Teacher qualifications:

An assignment for Science of Nursing 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: