

APS DISTRICT HIGH SCHOOL SCIENCE CURRICULUM FRAMEWORK

Course Title: Nursing Science I Course Number: SEE BELOW

Department: Science/Health and Human Services ADS Number: 15057244

Prerequisites: Successful completion of a Strand A course/2 years of mathematics

Length of Course: One Year Credit/PRI Area: .5 Science (Strand C) credit per Sem and 1.0 Practical Arts credit per Sem Grade Level(s): 11

Course and ADS Numbers:

Nursing Science I 453C1

Nursing Science I 824C2

Important Notes: A course that provides 1.5 credits per semester allows the student additional opportunities for in-depth study and application of the course content. The student must have a 2.0 GPA or higher and be able to lift 50 pounds.

COURSE DESCRIPTION: In Nursing Science I the student is introduced to the foundation and fundamentals of the human systems, anatomy, equilibrium, physics, culture, history of disease, and cellular functions. All of this is applied and builds on the understanding and care of patients. Curriculum is related and connected to the care of the patient and the treatment of disease. Literacy strategies are integrated throughout the curriculum.

References in parentheses following each performance standard align with the State of New Mexico Science Standards (NM), the State of New Mexico Health Education Standards (NM – H), the State of New Mexico Career Readiness Standards (NM – CR), the Albuquerque Public Schools Mathematics Standards (APS – MA), and the Albuquerque Public Schools Language Arts Standards (APS - LA).

STRATEGIES:

The “Illustrations” column in the *Program of Studies* provides exemplars of the performance standards, strategies, and best practices suggested by nursing teachers in the Albuquerque Public Schools (APS).

ASSESSMENTS:

Assessments may include the following: authentic and performance-based assessment, cooperative learning, teacher observations, checklists, tests and exams, formal and informal writing, small group and full class discussions, oral and multimedia presentations, projects, demonstrations, and portfolios. Assessments are based on appropriate rubrics.

SUGGESTED TEXTBOOKS AND INSTRUCTIONAL MATERIALS:

- *Structure and Function of the Body* (11th edition) by G.A.Thibodeau & K.T. Patton; Mosby Inc., St Louis; 2000.
- *Study Guide to Accompany Structure and Function of the Body* (11th edition) Linda Swisher, R.N., Ed.D.; Mosby Inc, St Louis; 2000.
- *Instructor’s Resource Manual and Test bank to Accompany Structure and Function of the Body* (11th edition) Judith Diehl, Rn, MS; Mosby Inc. St Louis (2005).
- *Diagnostic and Laboratory Test Reference* (5th edition) by Kathleen D PhD, RN and Timothy J. Pagana MD, FACS; Mosby Inc. St. Louis, 2001.
- *Clinical Companion to Medical Surgical Nursing* (2nd edition) by Dirksen, S. R., Lewis, S.M. & Heitkemper, M. M.; Mosby Inc. St Louis, 2000.
- *Nursing Diagnosis Reference Manual* (5th edition). Sparks, S.M. & Taylor, C.M.; Springhouse Corp. Pennsylvania. 2001.
- *Taber’s Cyclopedic Medical Dictionary* (19th edition) Donald Venes, MD MSJ Editor. F.A. Davis Co. Philadelphia. 2001.
- *Essentials of Human Anatomy and Physiology* (4th edition) by Elaine Marieb; (Benjamin-Cummings Publishing Co; 2002).
- *Memmler’s Structure and Function of the Human Body* (7th edition) by Barbara J. Cohen and Dena L. Wood. Lippincott Williams and Wilkins, Philadelphia (2000).
- *Essentials of Anatomy and Physiology* (3rd edition) by Valerie Scanlon and Tina Sanders. F.A. Davis and Company, Philadelphia. 1999.

SUGGESTED TITLES/AUTHORS WEB SITES:

Approved by HSCA: March 17, 2005

STRAND I: SCIENTIFIC THINKING AND PRACTICE**CONTENT STANDARD:** The student understands the processes of scientific investigations and uses inquiry and scientific ways of observing, experimenting, predicting, and validating to think critically.

- BENCHMARKS:**
- A. The student uses accepted scientific methods to collect, analyze, and interpret data and observations, and to design and conduct scientific investigations and communicates results.
 - B. The student understands that scientific processes produce scientific knowledge that is continually evaluated, validated, revised, or rejected.
 - C. The student uses mathematical concepts, principles, and expressions to analyze data, develop models, understand patterns and relationships, evaluate findings, and draw conclusions.

GRADE 11	PERFORMANCE STANDARDS	ILLUSTRATIONS
	<ol style="list-style-type: none"> 1. Describes the essential components of an investigation, including appropriate methodologies, proper equipment, and safety precautions (NM - I.I.I.1). 2. Designs and conducts scientific investigations that include (NM - I.I.I.2): <ul style="list-style-type: none"> • testable hypotheses, • controls and variables, • methods to collect, analyze, and interpret data, • results that address hypotheses being investigated, • predictions based on results, • re-evaluation of hypotheses and additional experimentation as necessary, and • error analysis. 3. Uses appropriate technologies to collect, analyze, and communicate scientific data (e.g., computers, calculators, balances, microscopes) (NM - I.I.I.3). 4. Conveys results of investigations using scientific concepts, methodologies, and expressions, including (NM - I.I.I.4; APS – MA IV.5E): <ul style="list-style-type: none"> • scientific language and symbols, • diagrams, charts, and other data displays, • mathematical expressions and processes (e.g., mean, median, slope, proportionality), • clear, logical, and concise communication, and • reasoned arguments. 	<p>1 – 9. When measuring vital signs, the student nurse uses analog manometers, non-mercury and digital thermometers and oxygen pulse oximeters along with accurate counting and calculations following prerequisite guidelines to assess and record “patient” objective information in relation to predetermined normal ranges. He/She:</p> <ul style="list-style-type: none"> • uses appropriately sized cuff, • does not inflate cuff beyond predetermine mm Hg pressure, • questions “patient” re: p.o. intake prior to taking temperatures, • records findings promptly and accurately, • recognizes findings outside normal limits and critical values, • uses manuals, as well as electronic V/S equipment, to collect and analyze patient data, • correctly records patient data on approved hospital and health care facility forms, • uses approved nursing process to assess, diagnose, plan, implement and evaluate an SOAPIE format and Nursing Diagnosis Diagram developed by CEC Nursing faculty to document analysis of patient data, • determines appropriate course of care based on acceptable patient care methodologies as approved by NANDA (North American Nursing Diagnosis Association), • writes daily NCP (Nursing Care Plan) diagrams and four intensive nursing care plans incorporating concepts from nursing science, anatomy, and physiology, nutrition and environmental health using scientific data collection methods, • uses logic and critical thinking to predict and determine accurate and appropriate/realistic nursing diagnoses using NANDA format based on individual patient needs. This is based on objective and subjective data collected from patients, history and physical assessments, patients’ medical records including

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	<p>5. Understands how scientific theories are used to explain and predict natural phenomena (e.g., plate tectonics, ocean currents, structure of atom) (NM - I.I.I.5).</p> <p>6. Understands how scientific processes produce valid, reliable results, including (NM - I.I.II.1):</p> <ul style="list-style-type: none"> • consistency of explanations with data and observations, • openness to peer review, • full disclosure and examination of assumptions, • testability of hypotheses, and • repeatability of experiments and reproducibility of results. <p>7. Uses scientific reasoning and valid logic to recognize (NM - I.I.II.2):</p> <ul style="list-style-type: none"> • faulty logic, • cause and effect, • the difference between observation and unsubstantiated inferences and conclusions, and • potential bias. <p>8. Understands how new data and observations can result in new scientific knowledge (NM - I.I.II.3; APS – MA IV.1E).</p> <p>9. Critically analyzes an accepted explanation by reviewing current scientific knowledge (NM - I.I.II.4).</p> <p>10. Examines investigations of current interest in science (e.g., superconductivity, molecular machines, age of the universe) (NM - I.I.II.5).</p> <p>11. Examines the scientific processes and logic used in investigations of past events (e.g., using data from crime scenes, fossils), investigations that can be planned in advance but are only done once (e.g., expensive or time-consuming experiments such as medical clinical trials), and investigations of phenomena that can be repeated easily and frequently (NM - I.I.II.6).</p> <p>12. Creates multiple displays of data to analyze and explain the relationships scientific investigations (NM - I.I.III.1).</p> <p>13. Uses mathematical models to describe, explain, and predict natural phenomena (NM - I.I.III.2; APS – MA I.16).</p>	<p>operative reports, physician’s progress notes, physical and respiratory therapy notes.</p> <ul style="list-style-type: none"> • selects from legally (set forth by the NM Nurse Practice Act) appropriate interventions to provide nursing care with highest probabilities and acceptable patient outcomes. <ul style="list-style-type: none"> √ competence in scientific investigation and process √ use of appropriate technologies √ reasoning skills/analysis √ completion of all activities √ effective communication • The student examines and analyzes scientific journals as related to medical advancement and development of diagnostic equipment. <ul style="list-style-type: none"> √ analysis √ effective writing elements <p>10, 11. The student utilizes the nursing process to examine and apply standardized nursing care programs individualized for specific patients to plan, implement, and evaluate patient outcomes in the clinical setting.</p> <ul style="list-style-type: none"> √ appropriate program design √ analysis <p>12 – 15. The student utilizes NCP diagrams on a daily basis with simulated and actual patients to display objective and subjective data and the relationship of assessment findings to diagnose, plan and implement care. He/She:</p>

GRADE 11	PERFORMANCE STANDARDS	ILLUSTRATIONS
	<p>14. Uses technologies to quantify relationships in scientific hypotheses (e.g., calculators, computer spreadsheets and databases, graphing software, simulations, modeling) (NM - I.I.III.3).</p> <p>15. Identifies and applies measurement techniques and considers possible effects of measurement errors (NM - I.I.III.4).</p> <p>16. Uses mathematics to express and establish scientific relationships (e.g., scientific notation, vectors, dimensional analysis) (NM - I.I.III.5).</p>	<ul style="list-style-type: none"> • evaluates further investigation and application of planned nursing care and adapts it to meet acceptable outcome criteria and • practices patient care procedures in the simulation labs for all critical procedures and must meet 100% of the identified objectives before moving on to actual patients. This improves student performance, confidence and skill. <ul style="list-style-type: none"> √ varied display of data √ effective communication √ accuracy √ analysis <p>16. The student uses mathematics to calculate using ratio and proportion and dimensional analysis to calculate medication doses for a variety of patients in a variety of settings.</p> <ul style="list-style-type: none"> √ mathematical applications √ accuracy

STRAND II: THE CONTENT OF SCIENCE-PHYSICAL SCIENCE**CONTENT STANDARD:** The student understands the structure and properties of matter, the characteristics of energy, and the interactions between matter and energy.**BENCHMARKS:** A. The student understands the transformation and transmission of energy and how energy and matter interact.

B. The student understands the motion of objects and waves and the forces that cause them.

GRADE 11	PERFORMANCE STANDARDS	ILLUSTRATIONS
	<ol style="list-style-type: none"> 1. Understands how heat can be transferred by conduction, convection, and radiation, and how heat conduction differs in conductors and insulators (NM - II.I.II.4). 2. Understands that the ability of energy to do something useful (work) tends to decrease (and never increases) as energy is converted from one form to another (NM - II.I.II.6). 3. Understands that electromagnetic waves carry energy that can be transferred when they interact with matter (NM - II.I.II.7). 4. Understands the concept of equilibrium (i.e., thermal, mechanical, and chemical) (NM - II.I.II.11). 5. Knows that there are four fundamental forces in nature: gravitation, electromagnetism, weak nuclear force, and strong nuclear force 	<p>The illustrations in science content standards II and III are enhanced and augmented by the student participating in a variety of other activities that include research, experiments, using models, oral and written presentations that utilize visuals (e.g., PowerPoint, posters, collage), simulations, working in small groups to create a teaching model, and producing a pamphlet.</p> <ol style="list-style-type: none"> 1. The student describes in detail how heat is gained or lost from the human body with respect to basic principles of blood circulation, vasoconstriction, vasodilatation, heat loss through evaporation secondary to function of the sudoriferous glands in the skin, and basic lower brain function of thermostatic control of body temperature. <ul style="list-style-type: none"> √ comprehension of key concepts √ effective communication 2. The student analyzes initial energy systems as they are transformed into kinetic energy. <ul style="list-style-type: none"> √ ability to articulate ideas √ analysis 3. The student applies understanding of ADP –ATP and glucose source for all body functions by experimenting with his/her own glucose levels. He/She conducts a fasting glucose test followed by post prandial. In addition, the student uses a urine dipstick to determine acetones, keystone, and pH levels. <ul style="list-style-type: none"> √ applications √ appropriate procedures 4. The student describes and explains how negative and positive feedback systems maintain homeostasis of the body functions. <ul style="list-style-type: none"> √ effective communication of key concepts <p>4 – 6. The student performs simple experiments using class 1, 2, and 3 levers (e.g., put pressure on the arm to demonstrate contraction of</p>

GRADE 11	PERFORMANCE STANDARDS	ILLUSTRATIONS
	<p>(NM - II.I.III.1).</p> <p>6. Knows that every object exerts gravitational force on every other object, how this force depends on the masses of the objects, and the distance between them (NM - II.I.III.2).</p> <p>7. Knows that materials containing equal amounts of positive and negative charges are electrically neutral, but that a small excess or deficit of negative charges produces significant electrical forces (NM - II.I.III.3).</p> <p>8. Understands the relationship between force and pressure, and how the pressure of a volume of gas depends on the temperature and the amount of gas (NM - II.I.III.4).</p> <p>9. Explains how electric currents cause magnetism and how changing magnetic fields produce electricity (e.g., electric motors, generators) (NM - II.I.III.5).</p>	<p>muscles). From here the student advances to a cat dissection to study the muscles to understand optimum length of muscles and to see that the length produces different forces against gravity. In a class discussion the student talks about the muscles, how they tie in with gravity and gives specific example to illustrate that concept (e.g., pushing against a force, putting pressure on the floor). He/She draws vector diagrams of the forces on a joint.</p> <ul style="list-style-type: none"> √ understanding the relationship between force and gravity √ involvement in all experiments √ skilled dissection √ active participation in discussion √ specific examples √ visual aids <p>7. The student explains how ion pumps between the phospholipid cellular membranes between muscle and nervous tissues allow for conduction of electrical impulses resulting in muscle movement. He/She explains how deficits or excess of fluids and electrolytes in the body affect optimal functioning.</p> <ul style="list-style-type: none"> √ understanding of key concepts √ clarity in communication <p>8. The student applies principles of force, pressure, and volume of gas when explaining respiration. He/She demonstrates how contraction of the diaphragm and elevation of the intercostals muscles increases the relative pressures inside the pleural cavity, thereby causing atmospheric air to enter the alveoli of the lungs. The student explains to simulated and/or actual patients how to inhale through the nose and exhale through the mouth to allow the atmospheric air to come into close contact with the vascular membranes in the nasal conchae, thereby warming and humidifying air prior to coming into contact with internal respiratory structures.</p> <ul style="list-style-type: none"> √ appropriate modeling √ applications √ clarity in communication <p>9, 10. The student explains (e.g., poster, collage, chart) how the polarization, depolarization, and repolarization through the electrical conduction system in the heart is represented on an electrocardiogram. The student researches a cardiac website that shows electrical</p>

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	<p>10. Represents the magnitude and direction of forces by vector diagrams (NM - II.I.III.6).</p> <p>11. Knows that when one object exerts a force on a second object, the second object exerts a force of equal magnitude and in the opposite direction on the first object (i.e., Newton's Third Law) (NM - II.I.III.7).</p> <p>12. Applies Newton's Laws to describe and analyze the behavior of moving objects, including (NM - II.I.III.8):</p> <ul style="list-style-type: none"> • displacement, velocity, and acceleration of a moving object, • Newton's Second Law, $F = ma$ (e.g., momentum and its conservation, the motion of an object falling under gravity, the independence of a falling object's motion on mass), and • circular motion and centripetal force. <p>13. Describes relative motion using frames of reference (NM - II.I.III.9).</p> <p>14. Describes wave propagation using amplitude, wavelength, frequency, and speed (NM - II.I.III.10).</p> <p>15. Explains how the interactions of waves can result in interference, reflection, and refraction (NM - II.I.III.11).</p> <p>16. Describes how waves are used for practical purposes (e.g., seismic data, acoustic effects, Doppler effect) (NM - II.I.III.12).</p>	<p>conduction patterns of the heart to obtain this information.</p> <ul style="list-style-type: none"> √ research strategies √ effective communication √ comprehension of key concepts √ relevant information <p>11, 12. By this time, the student has studied the muscular skeletal system. With this prior knowledge and work done in the cardiology unit, the student designs a motion (e.g., dance, throwing a ball) showing the starting point to the ending point. The design includes all the muscles used, which contracted, how force acts on that joint, the action of the muscles, and the direction that the muscle produces on the skeletal system.</p> <ul style="list-style-type: none"> √ all the required components √ completion of design √ effective design √ accuracy <p>13. The student describes in detail how skeletal muscle works using concepts of isotonic and isometric movements. He/She also demonstrates synergist and antagonist pairs in all muscle movements and applies elements of muscle tone, posture, and proper body alignment in caring for patients and maintaining healthy body mechanics in self and assigned patients.</p> <ul style="list-style-type: none"> √ understanding of the skeletal system √ appropriate modeling √ effective communication <p>14 – 16. The student learns during the cardiology unit about waves through looking at an EKG. The diagram produced in an EKG allows the student to measure the charges, the amplitude, wavelength, and frequency of the waves. The results come out on graph paper where each box represents a time frame that is different for each person. The student determines the heart beats, the amplitude (e.g., height of wave), and faults. The EKG can tell the student what is wrong with the heart allowing the student to examine causes.</p> <ul style="list-style-type: none"> √ individual participation √ ability to perform the required measurements √ accuracy (e.g., readings, measurements)

GRADE 11	PERFORMANCE STANDARDS	ILLUSTRATIONS
		√ analysis

STRAND III: THE CONTENT OF SCIENCE-EARTH AND SPACE

CONTENT STANDARD: The student understands the structure of Earth, the solar system, and the universe, the interconnections among them, and the processes and interactions of Earth's systems.

- BENCHMARKS:** A. The student examines the scientific theories of the origin, structure, contents, and evolution of the solar system and the universe, and their interconnections.
 B. The student examines the scientific theories of the origin, structure, energy, and evolution of Earth and its atmosphere, and their interconnections.

GRADE 11	PERFORMANCE STANDARDS	ILLUSTRATIONS
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GRADE 11	PERFORMANCE STANDARDS	ILLUSTRATIONS
	<ol style="list-style-type: none"> 1. Understands the scale and contents of the universe, including (NM - II.III.I.1): <ul style="list-style-type: none"> • range of structures from atoms through astronomical objects to the universe, and • objects in the universe such as planets, stars, galaxies, and nebulae. 2. Predicts changes in the positions and appearances of objects in the sky (e.g., moon, sun) based on knowledge of current positions and patterns of movements (e.g., lunar cycles, seasons) (NM - II.III.I.2). 3. Understands how knowledge about the universe comes from evidence collected from advanced technology (e.g., telescopes, satellites, images, computer models) (NM - II.III.I.3). 4. Describes the key observations that led to the acceptance of the Big Bang theory and that the age of the universe is over 10 billion years (NM - II.III.I.4). 5. Explains how objects in the universe emit different electromagnetic radiation and how this information is used (NM - II.III.I.5). 6. Examines the role that New Mexico research facilities play in current space exploration (e.g., Very Large Array, Goddard Space Center) (NM - II.III.I.7). 	<ol style="list-style-type: none"> 1. The content of the body is consistent with the universe. The student explains the structural levels of organization of the body from the level of atoms to the body as a whole. <ul style="list-style-type: none"> √ articulation of key concepts 2. The nursing student describes (e.g., oral, written, visual) how recurring hormonal cycles cause predictable changes in the human female allowing her to become pregnant or to avoid pregnancy by graphing changes in hormone levels, mood changes, cervical mucous changes and lunar calendar. <ul style="list-style-type: none"> √ representation of ideas √ effective communication 3. The student describes a historical perspective of the universe as it relates to medical advancement. He/She views microscopic and radiographic images of various parts of the human body to understand the relationships of the various body parts to each other in the human body as “universe.” <ul style="list-style-type: none"> √ connections √ clarity in communication 4, 5. The student researches current event news items and information (e.g., newspapers, TV, magazines) dealing with specific topics (e.g., cancer, morphological changes, Darwinian theory, carbon dating, evolution of the human body) and presents the information to the class. <ul style="list-style-type: none"> √ thorough research √ relevant information √ effective presentation 6. The student works in small groups to select a topic related to New Mexico research facilities which have a role in space exploration (each group selects a different topic), conducts the research, and presents to the class. After each presentation, the group facilitates a discussion eliciting information related to the structure and function of the earth’s atmosphere and/or human body. <ul style="list-style-type: none"> √ teamwork/collaboration √ thorough research √ relevant information

GRADE 11	PERFORMANCE STANDARDS	ILLUSTRATIONS
	<p>7. Explains plate tectonic theory and understand the evidence that supports it (NM - II.III.II.5).</p> <p>8. Describes how stars are powered by nuclear fusion, how luminosity and temperature indicate their age, and how stellar processes create heavier and stable elements that are found throughout the universe (II.III.I.6).</p> <p>9. Knows that Earth's systems are driven by internal (i.e., radioactive decay and gravitational energy) and external (i.e., the sun) sources of energy (NM - II.III.II.6).</p> <p>10. Describes convection as the mechanism for moving heat energy from deep within Earth to the surface and discusses how this process results in plate tectonics, including (NM - II.III.II.7):</p> <ul style="list-style-type: none"> • geological manifestations (e.g., earthquakes, volcanoes, mountain building) that occur at plate boundaries, and • impact of plate motions on societies and the environment (e.g., earthquakes, volcanoes). 	<ul style="list-style-type: none"> √ articulation of ideas √ effective presentation √ group facilitation √ participation in discussions √ audience response <p>7. The student learns that plate tectonics is the geological theory that states that pieces of Earth's lithosphere are in constant, slow motion, driven by convection currents in the mantle. This theory explains the formation, movement, and subduction of Earth's plates. To gain an understanding of the main idea of this theory, the student labels several figures by indicating the type of plate boundary it shows. Upon completion of the activity, the student answers in writing several questions posed by the activity.</p> <ul style="list-style-type: none"> √ individual participation √ completion of all activities √ reasonable response to essential question √ effective communication <p>8. The student uses the H-R diagram (e.g., plot of the absolute magnitudes of stars against their spectral types) in an exercise that permits him/her to explore the family relations among the stars in the sky. After completion of the exercise, the student writes a summary of what he/she learned.</p> <ul style="list-style-type: none"> √ completion of exercise √ accurate plotting and curve drawing √ synthesis √ effective communication <p>9, 10. The student describes how heat from the core of the body in a hyperthermic state is moved to the surface via vasodilation of peripheral vessels to decrease core temperature via convection, conduction, and evaporation.</p> <ul style="list-style-type: none"> √ comprehension of key concepts √ effective communication

GRADE 11	PERFORMANCE STANDARDS	ILLUSTRATIONS

STRAND IV: SCIENCE AND SOCIETY**CONTENT STANDARD:** The student understands how scientific discoveries, inventions, practices, and knowledge influence, and are influenced by, individuals and societies.**BENCHMARK:** The student examines and analyzes how scientific discoveries and their applications affect the world and explains how societies influence scientific investigations and applications.

GRADE 11	PERFORMANCE STANDARDS	ILLUSTRATIONS
	<ol style="list-style-type: none"> 1. Knows how science enables technology but also constrains it, and recognizes the difference between real technology and science fiction (e.g., rockets vs. antigravity machines, nuclear reactors vs. perpetual-motion machines, medical X-rays vs. Star-Trek tricorders) (NM - III.I.I.1). 2. Understands how advances in technology enable further advances in science (e.g., microscopes and cellular structure, telescopes and understanding of the universe) (NM - III.I.I.2). 3. Evaluates the influences of technology on society (e.g., communications, petroleum, transportation, nuclear energy, computers, medicine, genetic engineering) including both desired and undesired effects, including some historical examples (e.g., the wheel, the plow, the printing press, the lightning rod) (NM - III.I.I.3). 4. Understands the scientific foundations of common technologies (e.g., kitchen appliances, radio, television, aircraft, rockets, computers, medical X-rays, selective breeding, fertilizers and pesticides, agricultural equipment) (NM - III.I.I.4). 	<ol style="list-style-type: none"> 1. The nursing student knows the difference between radiographs, magnetic resonance imaging and computerized axial tomography and explains the benefits of each for determining patient outcomes. <ul style="list-style-type: none"> √ understanding of medical technologies √ articulation and expression of ideas 2, 8. The student experiences advances in technology during clinical observation rotations through cardiac catheterization, EsophagoGastroDuodeno - Endoscopy, and fluoroscopic orthopedic procedures. He/She watches operative procedures using fiberoptic cameras during laparoscopic abdominal surgeries. <ul style="list-style-type: none"> √ acquisition of current medical technologies √ real-life connections 3, 15. The student assesses how technological advances have benefited patient care by decreasing hospital stays, decreasing costs of care, decreasing co—morbidity associated with extended hospital stays. <ul style="list-style-type: none"> √ analysis/insights √ clear communication 4. The student discusses how changes in patient care have improved outcomes based on research-based nursing care. For example, he/she explains the rationale for TCDB and IS (turn cough and deep breathe and incentive spirometer) every hour during postoperative patient stays to avoid complications associated with bed rest. <ul style="list-style-type: none"> √ participation in discussions √ articulation of ideas √ understanding of concepts

GRADE 11	PERFORMANCE STANDARDS	ILLUSTRATIONS
	<p>5. Understands that applications of genetics can meet human needs and can create new problems (e.g., agriculture, medicine, cloning) (NM - III.I.5).</p> <p>6. Analyzes the impact of digital technologies on the availability, creation, and dissemination of information (NM - III.I.6).</p> <p>7. Describes how human activities have affected ozone in the upper atmosphere and how it affects health and the environment.</p> <p>8. Describes uses of radioactivity (e.g., nuclear power, nuclear medicine, radiometric dating) (NM - III.I.8).</p> <p>9. Describes how scientific knowledge helps decision makers with local, national, and global challenges (e.g., Waste Isolation Pilot Project [WIPP], mining, drought, population growth, alternative energy, climate change) (NM - III.I.9).</p>	<p>5. The nursing student identifies health care problems associated with various genetic abnormalities and discusses the pros and cons of genetic counseling with perspective parents. He/She knows the advantages of genetic programming for advances in medications and treatments for patients at risk.</p> <ul style="list-style-type: none"> √ comprehension of genetic issues √ clarity in communication √ dissemination of appropriate information <p>6. The student utilizes digital technologies during all aspects of patient care including, but not limited to, use of digital thermometers to assess patient temperatures, use of computerized medical records to access laboratory reports, operative reports, and history and physicals for data gathering aspects of the nursing process.</p> <ul style="list-style-type: none"> √ appropriate use of technology √ applications √ assessment <p>7. The student explains to patients the need for application of sun screen to protect skin surfaces from damaging effects of UV rays and potential for subsequent skin cancer formations.</p> <ul style="list-style-type: none"> √ effective communication √ appropriate information <p>8. The student explains aspects of nuclear medicine and uses of medical diagnostics.</p> <ul style="list-style-type: none"> √ clear communication √ understanding of the impact of radioactivity <p>9. The student appropriately applies scientific knowledge from research based nursing processes, NANDA approved and NIC (Nursing intervention classifications, and NOC (Nursing Outcomes Classification) listed criteria to plan and implement and evaluate all nursing care in simulated and actual patient care situations.</p> <ul style="list-style-type: none"> √ application of appropriate procedures √ assessment √ collaboration √ effective communication

GRADE 11	PERFORMANCE STANDARDS	ILLUSTRATIONS
	<p>10. Describes major historical changes in scientific perspectives (e.g., atomic theory, germs, cosmology, relativity, plate tectonics, evolution) and the experimental observations that triggered them (NM - III.I.I.10).</p> <p>11. Knows that societal factors can promote or constrain scientific discovery (e.g., government funding, laws and regulations about human cloning and genetically modified organisms, gender and ethnic bias, AIDS research, alternative-energy research) (NM - III.I.I.11).</p> <p>12. Explains how societies can change ecosystems and how these changes can be reversible or irreversible (NM - III.I.I.12).</p> <p>13. Describes how environmental, economic, and political interests impact resource management and use in New Mexico (NM - III.I.I.13).</p> <p>14. Describes New Mexico's role in nuclear science (e.g., Manhattan Project, WIPP, national laboratories) (NM - III.I.I.14).</p> <p>15. Identifies how science has produced knowledge that is relevant to individual health and material prosperity (NM - III.I.I.15).</p> <p>16. Understands that reasonable people may disagree about some issues that are of interest to both science and religion (e.g., the origin of life on Earth, the cause of the Big Bang, the future of Earth) (NM - III.I.I.16).</p>	<p>10. The nursing student tracks changes in acceptable medical and nursing care for patients based on advances in nursing theories and medical science. See also #4.</p> <ul style="list-style-type: none"> √ historical perspectives (e.g., history of medicine) √ articulation of ideas <p>11. The nursing student appropriately implements cost conscious care to provide optimum outcomes with minimum costs to patients, facilities and insurance companies in alignment with current national policies for health care cost containment.</p> <ul style="list-style-type: none"> √ adherence to guidelines and regulations √ provision of quality, yet cost effective practices <p>12, 13. Through lectures and text readings the student learns that society in some way has caused certain diseases to thrive (e.g., West Nile virus, hauntavirus). The student researches one such disease, preferably one that is predominant in New Mexico (e.g., poverty, diabetes in hispanics) and reports on its health affects in either an oral or written format.</p> <ul style="list-style-type: none"> √ thorough research √ effective presentation √ clarity in communication √ relevant information <p>14 - 15. The student participates in a discussion about New Mexico's role in nuclear science. Main ideas to come out of this are Los Alamos role in the creation of the bomb, its role in WWII, and the labs (e.g., Sandia Labs). Also the student learns that one of the reasons the Lovelace health system was created was for the training and research to be used by the NASA astronaut program.</p> <ul style="list-style-type: none"> √ active participation in discussion √ understanding of New Mexico's role in nuclear science development √ relevance/connections (e.g., use of nuclear medicine) <p>16. The student cares for patients from a variety of backgrounds, cultures and religions in a non-judgemental way ensuring that each patient cohort receives the best possible care and optimal outcomes.</p> <ul style="list-style-type: none"> √ understanding of issues √ objectivity

GRADE 11	PERFORMANCE STANDARDS	ILLUSTRATIONS
	<p>17. Identifies important questions that science cannot answer (e.g., questions that are beyond today’s science, decisions that science can only help to make, questions that are inherently outside of the realm of science)(NM - III.I.I.17).</p> <p>18. Understands that scientists have characteristics in common with other individuals (e.g., employment and career needs, curiosity, desire to perform public service, greed, preconceptions and biases, temptation to be unethical, core values including honesty and openness) (NM - III.I.I.18).</p> <p>19. Knows that science plays a role in many different kinds of careers and activities (e.g., public service, volunteers, public office holders, researchers, teachers, doctors, nurses, technicians, farmers, ranchers) (NM - III.I.I.19).</p>	<p>17. The student listens to a guest speaker (e.g., someone from the AIDS Society, technical person) talk about the epidemiology of AIDS (e.g., how it spreads, who gets it). After the lecture on this disease, the student listens to a person who has AIDS and/or a person who is living with it. That individual explains what it is like to live with it and the impact it has had on him/her. The student is free to ask questions. Afterwards, a discussion follows where the student talks about personal responsibilities.</p> <ul style="list-style-type: none"> √ listening skills √ appropriate behavior (e.g., questions) √ individual participation in discussion √ prevention theories <p>18, 19. The student explores a variety of careers in the health care fields while participating in clinical rotations. He/She may use the practical nursing background as a “springboard” into other health care careers. Based on the “people skills” gained while participating in the nursing program, he/she matures and performs functions far above those of his/her peers.</p> <ul style="list-style-type: none"> √ openmindedness √ personal growth √ explorative nature

STRAND V: HEALTH**CONTENT STANDARD:** The student acquires medical terminology and information that enables him/her to make sound health decisions.**BENCHMARK:** The student analyzes goals, behaviors, values, and other health factors that impact and promote personal and other individuals' health throughout life.

GRADE 11	PERFORMANCE STANDARDS	ILLUSTRATIONS
	<ol style="list-style-type: none"> 1. Describes the interrelationships of mental, emotional, social, and physical health throughout life (NM – H 1B). 2. Explains the impact of personal health behaviors on the functioning of body systems (NM – H 1C). 3. Analyzes how the family, peers, and community influence the health of individuals (NM – H 1D). 4. Examines how the environment influences the health of the community (NM – H 1E). 5. Describes how to delay onset and reduce risks of potential health problems during adulthood (NM – H 1F). 6. Recognizes how the prevention and control of health problems are influenced by research and medical advances (NM – H 1H). 7. Evaluates the availability and validity of health information, products, and services (NM – H 2A). 8. Demonstrates the ability to evaluate resources from home, school, and community that provide valid health information (NM – H 2B). 9. Demonstrates the ability to access school and community health services for self and others (NM – H 2D). 10. Analyzes situations requiring professional health services (NM – H 2F). 11. Analyzes the role of individual responsibility for enhancing health (NM – H 3A). 	<p>1 – 22. Throughout Nursing I the student has multiple opportunities to examine and apply concepts of disease, its symptoms, diagnosis and treatment on a personal level. Through discussions and a variety of activities he/she integrates and connects what is learned to himself/herself. As an example, the student performs a blood pressure measurement and then relates the significance of the work to himself/herself discussing what one can do to lower blood pressure (e.g., manage stress). This may then lead to relating, analyzing, evaluating, and implementing personal health goals and health plans. A current events activity allows for discussion on environmental issues and its health effects and other medical topics. The Science in Society Strand that emphasizes the role of technology opens the door for further discussion or activity engagement on its impact on health. Consequently, the health standards are met through the integration of the content in the other strands. Activity options:</p> <ul style="list-style-type: none"> • The student provides examples of cultural health practices and treatments (e.g., remedies, herbs, teas) and discusses the cultural practices and beliefs each represents. • The student brings in current events articles on health issues, discusses them, and compares them to older philosophies and practices. He/She looks at potential benefits and areas of concern. • The student participates in a project to find community resources related to a disease (e.g., Cancer Foundation) and prepares a presentation that includes preventive measures of the disease. • The student engages in a clinical experience in communication where the student looks at himself/herself, others, patients, and patients' families. He/She writes two skits - one using appropriate communication and one that uses inappropriate communication. The class compares the two. <ul style="list-style-type: none"> √ understanding of self and personal health √ understanding of health implications that promote

GRADE 11	PERFORMANCE STANDARDS	ILLUSTRATIONS
	<p>12. Examines the short-term and long-term consequences of safe, risky, and harmful behaviors (NM – H 3C).</p> <p>13. Evaluates strategies to manage stress (NM – H 3G).</p> <p>14. Recognizes that cultural practices can enrich and challenge health behaviors (NM – H 4A).</p> <p>15. Studies the effect of media and other factors on personal, family, peer, and community health (NM – H 4B).</p> <p>16. Demonstrates ways to communicate care, consideration, and respect of self and others (NM – H 5D).</p> <p>17. Analyzes health concerns that require collaborative decision making (NM – H6B).</p> <p>18. Predicts immediate and long-term impact of health decisions on the individual, family, peers, and community (NM – H 6C).</p> <p>19. Implements a plan for attaining a personal health goal (NM – H 6D).</p> <p>20. Formulates an effective plan for lifelong health (NM – H 6F).</p> <p>21. Assesses the effectiveness of communication methods for accurately expressing health information and ideas (NM – H 7A).</p> <p>22. Expresses information and opinions about health issues (NM – H 7B).</p>	<p>positive health behaviors</p> <p>√ individual participation in discussions and activities</p> <p>√ effective communication</p> <p>√ analysis</p> <p>√ connections</p> <p>√ personal reflection</p> <p>√ cultural understandings</p> <p>√ teamwork/collaboration</p> <p>√ awareness of support services</p> <p>√ goal identification</p>

STRAND VI: CAREER READINESS**CONTENT STANDARD:** The student prepares for entering the professional arena in a health-care setting.**BENCHMARKS:** A. The student explores the expectations, guidelines, and roles of a medical professional.

B. The student applies the principles of professional behavior in the health-care setting.

GRADE 11	PERFORMANCE STANDARDS	ILLUSTRATIONS
	<ol style="list-style-type: none"> 1. Examines responsibilities, activities, and practices of a practical nurse (CR – 1B). 2. Defines short term and long term professional goals (CR – 2A). 3. Recognizes personal strengths and areas of professional growth (CR – 2B). 4. Develops technological skills (CR – 3D). 5. Identifies positive behavior, conduct, and social manners within the school, workplace, and community (CR – 4A). 6. Demonstrates ability to work cooperatively to accomplish objectives (CR – 4B). 7. Identifies appropriate and legal behaviors necessary to obtain and maintain employment (CR – 4C). 8. Investigates safety standards related to the school, community, and workplace (CR – 4D). 9. Identifies individual interests, aptitudes, and skills within the group to accomplish goals (CR – 5A). 10. Demonstrates ability to work with others from diverse backgrounds (CR – 5C). 11. Applies critical thinking and problem-solving skills, or identifies problems and uses critical thinking skills and team skills, to solve problems (CR – 5E). 12. Recognizes the results of the process (CR – 5F). 	<p>1 – 12. The student researches (e.g., Internet, medical library, journals) professional options and opportunities in the area of nursing and uses that information to develop a career plan. He/She includes in the plan short term and long term goals; areas of strength and growth; and the skills (e.g., technical, communication, education) needed to be successful in the laboratory and health-care setting. Another component of the plan is a description of the working environment in a clinical setting. This includes care for patients, working with peers, staffs at health care facilities, and an example of a health plan for a patient. Before the student submits his/her plan to the instructor, he/she discusses and shares the plan with other students in a small group. The members of the group critique each other's plans and make recommendations for modification.</p> <ul style="list-style-type: none"> √ thorough research √ relevant information √ completion of career plan √ realistic and viable plan √ insights √ personal connections √ problem-solving skills √ all required components √ collaboration and cooperation √ open to constructive criticism √ adjustments, if necessary

STRAND VII: LITERACY**CONTENT STANDARD:** The student communicates nursing principles through reading, writing, and speaking opportunities.**BENCHMARK:** The student demonstrates proficiency in reading comprehension, specialized vocabulary, and a variety of writing and speaking requirements.

GRADE 11	PERFORMANCE STANDARDS	ILLUSTRATIONS
	<p>11th grade language arts standards are addressed in this strand.</p> <ol style="list-style-type: none"> 1. Recognizes the concepts and details in informational texts in new ways and describes the advantages and disadvantages for the new organization (APS – LA I.2). 2. Decodes vocabulary using knowledge of Anglo-Saxon, Greek, and Latin bases and affixes to determine meaning of words (APS – LA I.4). 3. Accurately interprets information presented in a technical format (e.g., charts, diagrams, tables) (APS – LA I.7). 4. Compares/contrasts effectiveness of deductive and inductive reasoning in a variety of texts (APS – LA I.8). 	<ol style="list-style-type: none"> 1, 3, 4. During intense emersion in anatomy and physiology the nursing student selects and reads an outside book on the subject of health, fitness, diet and/or exercise. The book should be one that stimulates the student to make positive changes in his/her own lifestyle. He/She correlates the information in the book with the science theory in A & P and PNS and writes a summary (book report) that identifies pros and cons of the author’s viewpoints regarding the various health recommendations. The book report must be properly formatted and referenced. The purpose of this assignment is to encourage the student to actively pursue healthy lifestyle choices and to be more aware of the information available for his/her patients/clients in the community. <ul style="list-style-type: none"> √ connections √ analysis 2. Prior to beginning formal course work, the student is provided with a list of terms, roots, prefixes and suffixes related to medical, nursing and scientific terminology. He/She is expected to memorize and incorporate terms into his/her usable vocabulary. The student is expected to understand and use medical nursing and scientific terminology throughout course work and to carry through into career settings. <ul style="list-style-type: none"> √ acquisition of new vocabulary √ application 3 - 5. The nursing student learns to utilize the nursing process of assessment, diagnosis, planning, implementing and evaluating during patient care in simulated and actual patient care settings to provide science and research based patient care. <ul style="list-style-type: none"> √ application of knowledge √ proper procedures √ accurate diagnosis

GRADE 11	PERFORMANCE STANDARDS	ILLUSTRATIONS
	<p>5. Uses critical analysis to gain meaning, develop thematic connections, and synthesize ideas (APS – LA II.5).</p> <p>6. Demonstrates increased competence and fluency in using the writing process to create a final product (APS – LA III.1).</p> <p>7. Demonstrates increased competence and fluency in using elements of effective writing (APS – LA III.2).</p> <p>8. Demonstrates increased competence and fluency in using a variety of technology (APS – LA III.3).</p> <p>9. Demonstrates increased competence with speaking and language strategies (APS – LA IV.1).</p> <p>10. Demonstrates increased competence and fluency with appropriate types of speaking (APS – LA IV.3).</p> <p>11. Listens to and analyzes a presentation or discussion (APS – LA V.1).</p> <p>12. Conducts research and collects data from in-depth field studies (APS – LA VI.1).</p> <p>13. Obtains and sends information electronically to support advanced research (APS – LA VI.2).</p> <p>14. Uses a variety of technology (APS – LA VI.5).</p> <p>15. Recognizes and continues to use the elements of formal citations to</p>	<p>6, 7. The nursing student writes nursing care plan diagrams every day on every patient to gain proficiency and practices legal documentation of patient care daily throughout clinical rotations as he/she actively participates with the health care team.</p> <ul style="list-style-type: none"> √ effective writing elements √ collaboration/cooperation √ consistent documentation <p>7. All charting is done as a first draft, reviewed by instructor and corrected, and finally written in the patient’s chart (legal document) when all information is correct and format, spelling, and effective word use is appropriate for inclusion in the patient’s legal record. All notes are signed by both student nurse and licensed nurse (instructor).</p> <ul style="list-style-type: none"> √ adherence to the writing process √ effective writing elements √ development of writing proficiency √ proper formatting <p>8 – 18. The student works independently, in small and large groups to present relevant information to classmates and colleagues verbally using a variety of multimedia formats. In addition, during the course of study he/she creates and writes “children’s” books on at least two anatomical systems. The student properly formats (e.g., APA), presents, and references all written material.</p> <ul style="list-style-type: none"> √ teamwork/collaboration √ relevant information √ proper documentation √ clarity in communication √ creativity √ effective presentation √ use of technology √ analysis/insights √ audience response

GRADE 11	PERFORMANCE STANDARDS	ILLUSTRATIONS
	<p>document sources (APS – LA VI.6).</p> <p>16. Accesses appropriate style manuals as research guides (APS – LA VI.7).</p> <p>17. Synthesizes information from multiple research studies to draw conclusions and inferences that go beyond those found in any of the individual studies (APS – LA VI.9).</p> <p>18. Synthesizes and organizes information from a variety of sources to inform and persuade an audience (APS – LA VI.9).</p>	