**Course Description:**

Students will apply practical application of a wide range of clinical duties. Topics covered will include hematology, urinalysis, hematopoiesis processes, body chemistry, microbiology, and blood typing. Students will perform laboratory exercises illustrating principles of the cell and human physiology. Emphasis is given to safe handling, collection procedures, and preparation of specimens. Additionally, students will correlate and document clinical findings and maintain quality management in a clinical laboratory.

**Strand 1. Business Operations/21st Century Skills**

Learners apply principles of economics, business management, marketing and employability in an entrepreneur, manager and employee role to the leadership, planning, developing and analyzing of business enterprises related to the career field.

**Outcome 1.1 Employability Skills**

Develop career awareness and employability skills (e.g., face‐to‐face, online) needed for gaining maintaining employment in diverse business settings.

**Competencies**

1.1.2. Identify the scope of career opportunities and the requirements for education, training,

certification, licensure and experience

1.1.4. Describe the role and function of professional organizations, industry associations and

organized labor and use networking techniques to develop and maintain professional

Relationships

1.1.6. Explain the importance of work ethic, accountability and responsibility and demonstrate

associated behaviors in fulfilling personal, community and workplace roles.

**Outcome 1.3 Business Ethics and Law**

Analyze how professional, ethical and legal behavior contributes to continuous improvement in organizational performance and regulatory compliance

**Competencies**

1.3.1. Analyze how regulatory compliance affects business operations and organizational

performance.

1.3.2. Follow protocols and practices necessary to maintain a clean, safe and healthy work

environment.

1.3.3. Use ethical character traits consistent with workplace standards (e.g., honesty, personal

integrity, compassion, justice).

1.3.5. Access and implement safety compliance measures (e.g., quality assurance information, safety

data sheets [SDSs], product safety data sheets [PSDSs], United States Environmental

Protection Agency [EPA], United States Occupational Safety and Health Administration

[OSHA]) that contribute to the continuous improvement of the organization

**Outcome 1.4 Knowledge Management and Information Technology**

Demonstrate current and emerging strategies and technologies used to collect, analyze, record and share information in business operations.

**Competencies**

1.4.3. Verify compliance with security rules, regulations and codes (e.g., property, privacy, access, accuracy issues, client and patient record confidentiality) pertaining to technology specific to the industry pathway.

**Outcome 2.1. Human Anatomy, Physiology, and Pathophysiology**

Describe the various human body systems, alterations related to the

normal developmental process and possible dysfunctions.

**Competencies**

2.1.1. Identify body planes, directions, cavities, quadrants and regions.

2.1.2. Describe the physical characteristics, components and function of blood (e.g., ABO, Rh, blood cells, precursors and respiratory)

2.1.3. Describe the structures and functions of the cardiovascular system and trace the path of blood and identify factors affecting blood flow.

2.1.4. Describe how blood pressure is controlled and identify factors influencing changes in blood pressure.

2.1.5. Describe the structures and functions of the respiratory system.

2.1.6. Describe function of nerve tissue, nervous system, including regions of the brain.

2.1.7. Describe the structures and functions of the musculoskeletal system.

2.1.8. Describe the structures and functions of the digestive/excretory system.

2.1.9. Describe the structures and functions of the renal/urinary system.

2.1.10. Describe the structures and functions of the immune system.

2.1.11. Describe the structures and functions of the endocrine system.

2.1.12. Differentiate between the structures and functions of the male and female reproductive systems.

2.1.13. Describe the structures and functions of the integumentary system.

2.1.14. Describe the difference between pathology and physiology and the conditions typically observed during a disease state.

*An “X” indicates that the pathway applies to the outcome.*

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Pathways** | X | Health Information Management | x | Medical Bioscience | X | Allied Health and Nursing | | | X | Exercise Science and Sports Medicine |
| **Green Practices** |  | Green-specific |  | Context-dependent | | |  | Does not apply | | |

**Outcome 2.2. Evaluate Body Systems**

Assess the biopsychosocial state of the patient and document using medical terminology.

**Competencies**

2.2.1. Provide privacy and demonstrate sensitivity for diverse populations.

2.2.2. Contact interpretive services for non‐English speaking and English Language Learners (ELL).

2.2.3. Use developmentally appropriate language to systematically review disease processes related to each body system.

2.2.4. Obtain and document vital signs.

2.2.5. Identify and categorize level of consciousness and cognition.

*An “X” indicates that the pathway applies to the outcome.*

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Pathways** | X | Health Information Management | x | Medical Bioscience | X | Allied Health and Nursing | | | X | Exercise Science and Sports Medicine |
| **Green Practices** |  | Green-specific |  | Context-dependent | | |  | Does not apply | | |

**Outcome 2.3. Medical Terminology**

Decipher medical terms through word origin and structure with an emphasis on derivation, meaning, pronunciation and spelling.

**Competencies**

2.3.1. Build and decipher medical term meanings by identifying and using word elements (e.g., word

roots, prefixes, suffixes, combining forms).

2.3.2. Apply the rules used to build singular and plural forms of medical terminology derived from

the Greek and Latin language.

2.3.3. Use diagnostic, symptomatic and procedural terms to read and interpret various medical

reports.

2.3.4. Use abbreviations and symbols to identify anatomical, physiological and pathological classifications and the associated medical specialties and procedures.

2.3.5. Communicate medical instructions and prepare medical documents using medical terminology.

*An “X” indicates that the pathway applies to the outcome.*

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Pathways** | X | Health Information Management | x | Medical Bioscience | X | Allied Health and Nursing | | | X | Exercise Science and Sports Medicine |
| **Green Practices** |  | Green-specific |  | Context-dependent | | |  | Does not apply | | |

**Strand 3. Therapeutic Interventions**

Learners will assist with improving the individual's health outcome and quality of life throughout the lifespan within their scope of practice.

**Outcome 3.1. Environmental Interventions**

Create and maintain a safe, sterile, efficient, and developmentally appropriate care environment.

**Competencies**

3.1.1. Use standard precaution guidelines, recommended by the governing bodies for reducing the risk of transmission of pathogens.

3.1.2. Maintain individuals’ rights, respect individual’s choices and describe informed consent.

3.1.3. Describe confidentiality guidelines in the Health Insurance Portability and Accountability Act

(HIPAA).

3.1.4. Decrease the risk of injury to individuals or others by using authorized strategies.

3.1.5. Identify and remove environmental and electrical hazards to decrease the risk of falls, injury, or ingestion of dangerous materials.

3.1.6. Identify risks associated with chemical, electrical, and aquatic elements in the work environment.

3.1.7. Describe and follow the precautions used in oxygen therapy and pressurized gases.

3.1.8. Clean, store, or dispose of supplies, specimens and laboratory glassware following protocol and standard precautions.

3.1.9. Determine bleeding risk factors and implement precautions.

3.1.10. Implement disaster preparedness response for emergency situations.

3.1.11. Identify risk factors of exposure to hazardous materials and demonstrate safety precautions.

3.1.12. Differentiate and apply principles of aseptic and sterile techniques.

3.1.13. Follow Occupational Health and Safety Administration protocol for exposure and disposal of contaminated hazardous waste.

3.1.14. Use principles of ergonomics to perform therapeutic interventions.

3.1.15. Account for all instruments, supplies and equipment.

3.1.16. Control the level of distractions and noise in a patient care environment.

3.1.17. Identify and respond to emergency call lights and alarms.

*An “X” indicates that the pathway applies to the outcome.*

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Pathways** | X | Health Information Management | x | Medical Bioscience | X | Allied Health and Nursing | | | X | Exercise Science and Sports Medicine |
| **Green Practices** |  | Green-specific |  | Context-dependent | | |  | Does not apply | | |

**Outcome 3.4. Emergency Interventions**

Identify, activate and respond to medical, environmental, mechanical and natural emergencies and document interventions and outcomes.

**Competencies**

3.4.1. Perform cardiopulmonary resuscitation (CPR), first‐aid and automated external defibrillation

(AED).

3.4.2. Recognize rescuer duties, victim and rescuer safety

3.4.3 Recognize and treat breathing problems

**Strand 4. Assistive Care**

Learners demonstrate the skills and knowledge to provide personal assistive care for the activities of daily living to a variety of individuals across stages of development within their scope of practice.

**Outcome 4.1. Scope of Practice**

Describe the roles and responsibilities of assistive personnel and identify the medical specialists who treat disorders of each body system.

**Competencies**

4.1.1. Describe the guidelines of the governing body concerning abuse, mistreatment, neglect and

misappropriation of an individual’s property.

4.1.2. Recognize and document changes in an individual’s condition and inform supervisors.

4.1.3. Provide input to and work within an individualized plan of care developed by the interdisciplinary team.

4.1.4. Describe the primary purpose of different healthcare settings.

4.1.5. Identify the medical specialists who treat disorders of each body system.

*An “X” indicates that the pathway applies to the outcome.*

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Pathways** | X | Health Information Management | x | Medical Bioscience | X | Allied Health and Nursing | | | X | Exercise Science and Sports Medicine |
| **Green Practices** |  | Green-specific |  | Context-dependent | | |  | Does not apply | | |

**Outcome 4.2. Therapeutic Communication and Interpersonal Skills**

Demonstrate and document communication techniques and behaviors

when communicating and interacting with individuals.

**Competencies**

4.2.1. Interpret non‐verbal communication, including gestures, posture, touch, facial expressions, eye contact, body movements, avoidance and appearance.

4.2.2. Describe the importance of maintaining an individual’s personal space.

4.2.3. Identify the importance of empathy in interpersonal relationships and the need for kindness, patience and listening.

4.2.4. Maintain aids that promote oral, auditory and visual health (e.g., eye glasses, hearing aids,

dentures).

4.2.5. Arrange food and utensils on the meal tray in a clock fashion for visually impaired individuals.

4.2.6. Position an individual for meals to avoid choking and assist in feeding.

4.2.7. Maintain a proper environment for eating (e.g., noxious odors, contaminated items, loud

noises).

4.2.8. Provide aids to facilitate communication for speech impaired individuals (e.g., picture cards,

slates, notepads).

4.2.9. Demonstrate de-escalation techniques with emotional support.

4.2.10. Describe the importance of improved communication skills and independent of independent tasks for an individual with developmental and/or physical disabilities.

**Outcome 4.3. Pathogenic Microorganisms, Infection Control and Infection**

Use principles of infection control to prevent the growth and spread of pathogenic microorganisms and infection.

**Competencies**

4.3.1. Describe the chain of infection.

4.3.2. Describe mechanisms for the spread of infection.

4.3.3. Describe methods of controlling or eliminating microorganisms and the importance of practices that hinder the spread of infection.

4.3.4. Identify and use appropriate level of personal protective equipment (PPE) when encountering body fluids, potential of splashing, or respiratory droplets.

4.3.5. Demonstrate various decontamination techniques and procedures.

4.3.6. Identify and follow standard precaution guidelines.

4.3.7. Identify, follow, and document isolation precautions.

4.3.8. Identify signs and symptoms of infection.

*An “X” indicates that the pathway applies to the outcome.*

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Pathways** | X | Health Information Management | x | Medical Bioscience | X | Allied Health and Nursing | | | X | Exercise Science and Sports Medicine |
| **Green Practices** |  | Green-specific |  | Context-dependent | | |  | Does not apply | | |

**Strand 5. Bioscience Research and Development**

Learners will demonstrate the skills and knowledge of interpreting laboratory requests, using protective clothing and hazardous material containment, specimen collection procedures, a variety of laboratory testing and techniques and maintenance of laboratory equipment and supplies.

**Outcome 5.1. Handling, Preparation, Storage and Disposal**

Follow standard operating protocols for handling, preparing, storing and disposing of

specimens supplies and equipment.

**Competencies**

5.1.1. Use standard operating procedures for the safe use of instruments, equipment and gas

cylinders.

5.1.2. Locate and use safety data sheets to prepare and interpret labels for chemicals, supplies, and to identify hazards associated with handling and storing chemical materials.

5.1.3. Neutralize acids, bases, or caustic solutions for handling and disposal.

5.1.4. Recognize clean room integrity using Standard Operating Procedures (SOPs).

5.1.5. Sample, monitor and record the environmental conditions of the facility (e.g. air quality, humidity, temperature, microbial contaminations).

5.1.6. Adjust, calibrate, maintain and perform systems diagnostics on laboratory equipment per standard operating procedure (SOP) and equipment specifications.

5.1.7. Maintain equipment logs and determine when to perform, implement, or schedule preventive maintenance and/or systems updates.

5.1.8. Verify expiration dates and lot numbers.

5.1.9. Implement a chemical inventory system that includes all pertinent information regarding stability, hazards and sensitivity per standard operating procedure (SOP).

5.1.10. Maintain an inventory system for manufactured products per standard operating procedure (SOP).

5.1.11. Maintain separate in‐processing, quarantine and release areas.

5.1.12. Monitor and maintain animal behavior, welfare and husbandry per standard operating procedure (SOP).

*An “X” indicates that the pathway applies to the outcome.*

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Pathways** | X | Health Information Management | x | Medical Bioscience | X | Allied Health and Nursing | | | X | Exercise Science and Sports Medicine |
| **Green Practices** |  | Green-specific |  | Context-dependent | | |  | Does not apply | | |

**Outcome 5.2. Foundations of Chemistry**

Use standard operating procedure (SOP) when performing systematic and methodical application of general and organic chemistry principles to examine the structures, their functions, their binding to other molecules and the methodologies for their purification and characterization.

**Competencies**

5.2.1. Draw electronic configurations of elements, compounds and mixtures.

5.2.2. Use the periodic table to describe atomic structure and to characterize elements based on the

functional group.

5.2.3. Differentiate between organic and inorganic compounds.

5.2.4. Use common and chemical nomenclature for organic and inorganic materials.

5.2.5. Write names and formulas for common compounds.

5.2.6. Calculate mole, molarity, normality, percent weight per volume (w/v) and percent volume per volume (v/v).

5.2.7. Describe the chemical bonding and bond types, including ionic and covalent and the

relationships that they have with physical state of materials.

5.2.8. Apply the concepts of stoichiometry and the laws of thermodynamics to chemical reactions.

5.2.9. Perform spectroscopy of biological materials explaining the principles behind the procedures, the purpose of a blank and determine the concentration of biomolecular samples.

5.2.10. Calculate the volume, temperature and pressure of gases using the ideal gas law, Charles Law, Boyles Law and Beer's Law.

5.2.11. Balance chemical reactions.

5.2.12. Define catalyst and identify materials used as catalysts, including enzymes.

5.2.13. Predict endothermic and exothermic characteristics of a chemical reaction.

5.2.14. Use naming systems, including common and International Union of Pure and Applied Chemistry (IUPAC) conventions.

5.2.15. Describe, use and calibrate precision weighing and measuring techniques (e.g., analytical balance, micropipette) that are based on the metric system.

5.2.16. Calculate errors in measurements based on data acquired using common laboratory equipment.

5.2.17. Use standard rules for determining the number of significant figures in measurements and in the answers to corresponding calculations.

5.2.18. Calculate conversions of metric and standard units .

*An “X” indicates that the pathway applies to the outcome.*

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Pathways** | X | Health Information Management | x | Medical Bioscience | X | Allied Health and Nursing | | | X | Exercise Science and Sports Medicine |
| **Green Practices** |  | Green-specific |  | Context-dependent | | |  | Does not apply | | |

**Outcome 5.3. Microbiology Testing and Technology**

Describe the morphology and process of reproduction of microorganisms important in clinical disease and biotechnology applications and perform assays as a diagnostic tool to detect the presence of a pathogen when handling and storing specimens and preservatives for biologicals.

**Competencies**

5.3.1. Explain microbial taxonomy and classification systems and use them to identify microbial

organisms.

5.3.2. Compare and contrast cellular structure and functions of prokaryotic and eukaryotic cells.

5.3.3. Differentiate between bacterial metabolism, reproduction, cell structures, and their functions.

5.3.4. Identify aerobic bacteria through morphological, physical and biochemical properties.

5.3.5. Describe the structure of viruses and differentiate between types.

5.3.6. Explain virulence, pathogenicity and the factors that contribute to pathogenicity.

5.3.7. Describe types and features of passive and active transport systems.

5.3.8. Describe molecular behavior of large molecules, including carbohydrates, lipids, proteins and nucleotides.

5.3.9. Explain how chemical energy operates major cell processes (e.g., biosynthesis, movement,

transport, growth).

5.3.10. Explain factors that affect and optimize rates of enzyme assay reactions.

5.3.11. Perform an enzyme‐linked immunosorbent assay (ELISA) and interpret the results.

5.3.12. Perform biochemical assays of proteins, lipids, carbohydrates, nucleic acids and enzymes.

5.3.13. Perform an assay for pathogen and susceptibility.

5.3.14. Describe the uses and limitations of various lab assays (e.g., HPLC, immunoassay, drainage cell, multi aspect, latex agglutination, spectrophotometry).

*An “X” indicates that the pathway applies to the outcome.*

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Pathways** | X | Health Information Management | x | Medical Bioscience | X | Allied Health and Nursing | | | X | Exercise Science and Sports Medicine |
| **Green Practices** |  | Green-specific |  | Context-dependent | | |  | Does not apply | | |

**Outcome 5.4. Molecular and Genetic Technology**

Perform molecular and genetic applications using knowledge of nucleic acid structure and function, DNA replication, transcription, translation, chromosome structure and remodeling and regulation of gene expression in prokaryotes and eukaryotes.

**Competencies**

5.4.1. Predict and explain offspring genotypes and phenotypes using basic mode of genetics.

5.4.2. Identify complex gene expression and transmission patterns.

5.4.3. Explain and model the structure of DNA from nucleotide to chromosome.

5.4.4. Model the Central Dogma Theory.

5.4.5. Describe the processes involved in gene regulation.

5.4.6. Identify and isolate peptides and proteins.

5.4.7. Summarize the steps in creating a recombinant DNA molecule.

5.4.8. Isolate and purify nucleic acids, including chromosomal and extra‐chromosomal DNA molecules.

5.4.9. Compare nucleic acids and chromosomal DNA molecules using a sequence database.

5.4.10. Perform and interpret the results of restriction enzyme digests.

5.4.11. Apply concepts of a pedigree.

5.4.12. Perform and interpret the results of a polymerase chain reaction to isolate proteins.

5.4.13. Use electrophoresis to separate nucleic acids and determine molecular weight.

5.4.14. Explain results from the Human Genome project and other sequencing projects and explain how gene sequencing is performed.

5.4.15. Perform gene analysis to determine the source of an isolated pathogen.

5.4.16. Explain the role of RNA and its role in gene expression.

*An “X” indicates that the pathway applies to the outcome.*

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Pathways** | X | Health Information Management | x | Medical Bioscience | X | Allied Health and Nursing | | | X | Exercise Science and Sports Medicine |
| **Green Practices** |  | Green-specific |  | Context-dependent | | |  | Does not apply | | |

**Outcome 5.5. Laboratory Standard Operational Procedures**

Perform methods and techniques using protocols in order to conduct an experiment.

**Competencies**

5.5.1. Follow standard operating procedure (SOP) to aseptically collect and prepare dry and wet samples for analysis.

5.5.2. Prepare and dispense stock reagents, buffers, media and solutions by calculating concentrations, adjusting factors such as pH and selecting purification techniques and containers.

5.5.3. Test and maintain the integrity of stains, reagents, chemicals and mounts.

5.5.4. Select and apply sterilization methods for reagents, buffers, media and solutions.

5.5.5. Explain the principles of microscopy and process a specimen for light microscopy.

5.5.6. Prepare, incubate and identify colonies microscopically and macroscopically (e.g., colonial morphology, staining procedures, biochemical).

5.5.7. Perform separation techniques, including chemical separations

(chromatography), centrifugation, distillation and filtration and describe their principles and interpret the results.

5.5.8. Titrate liquids.

5.5.9. Transfer gases, liquids and solids from storage containers to equipment used in the

laboratory.

5.5.10. Use aseptic laboratory techniques while working.

5.5.11. Perform a chromatography separation of a given mixture of substances.

5.5.12. Comply with industry‐based and required regulatory quality‐assurance practices (e.g., quality control [QC], Good Laboratory Practice [GLP], Good Manufacturing Practice [GMP]) for documentation.

*An “X” indicates that the pathway applies to the outcome.*

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Pathways** | X | Health Information Management | x | Medical Bioscience | X | Allied Health and Nursing | | | X | Exercise Science and Sports Medicine |
| **Green Practices** |  | Green-specific |  | Context-dependent | | |  | Does not apply | | |

**Outcome 5.6. Culturing**

Perform experimental techniques used in cell biology to study cell growth, manipulation and evaluation.

**Competencies**

5.6.1. Identify the structure of cells and the functions of their components.

5.6.2. Explain classification, composition and preparation of culture media and prepare media for

propagation.

5.6.3. Identify bacteriologic methods necessary for isolation and identification of organisms.

5.6.4. Operate basic microbiology and analytical equipment and examine biological specimens.

5.6.5. Isolate, propagate, maintain and harvest pure cell lines following standard operating procedure (SOP).

5.6.6. Verify culture cell lines and determine the cause or causes of culture failures following standard operating procedure (SOP).

5.6.7. Explain the collection and handling of fungal, mycobacterial and viral specimens following standard operating procedure (SOP).

5.6.8. Explain Koch’s Postulates and their use in determining primary and secondary pathogens.

5.6.9. Describe how vectors are used to transform host and microorganisms.

5.6.10. Correlate bacterial binary fission with generation time.

5.6.11. Describe physical factors that affect microbial growth and identify a normal bacteria

population growth curve.

5.6.12. Calculate values of cell concentration for both batch and continuous cultivation

5.6.13. Identify hormones used to stimulate cell growth.

5.6.14. Test for antibiotic susceptibility.

5.6.15. Explain how cell cultures can be used to assay viability and cytotoxicity.

5.6.16. Demonstrate cryopreservation techniques by freezing and thawing cells.

*An “X” indicates that the pathway applies to the outcome.*

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Pathways** | X | Health Information Management | x | Medical Bioscience | X | Allied Health and Nursing | | | X | Exercise Science and Sports Medicine |
| **Green Practices** |  | Green-specific |  | Context-dependent | | |  | Does not apply | | |

**Outcome: 5.8. Biotechnology Research and Experiments**

Conduct a problem-based study, applying scientific methodology and using descriptive statistics to communicate and support predictions and conclusions.

**Competencies**

5.8.10. Create, interpret and use tabular and graphical displays and describe the data.

5.8.6. Define the concepts of confidence limit and significant figures.

5.8.8. Compute measures of central tendency and dispersion to interpret results and draw

conclusions.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Pathways** | X | Health Information Management | x | Medical Bioscience | X | Allied Health and Nursing | | | X | Exercise Science and Sports Medicine |
| **Green Practices** |  | Green-specific |  | Context-dependent | | |  | Does not apply | | |

**Outcome 5.9. Clinical Laboratory Techniques and Procedures**

Perform and interpret clinical laboratory techniques and procedures.

**Competencies**

5.9.1. Maintain the integrity of a clinical sample, including patient/client identification and chain of custody and explain how to adhere to chain‐of‐custody guidelines when required (e.g., forensic studies, drug screen).

5.9.2. Describe control substance procedures, protocols, documentation and labeling techniques.

5.9.3. Differentiate between aseptic and sterile procedures when collecting specimens and maintain

bio‐hazardous materials procedures (e.g., urine, feces, sputum, blood).

5.9.4. Discuss the methods of blood collection, specimen processing and labeling procedures and the

potential problems that may occur.

5.9.5. Identify patient/client and inform them of the medical procedure to be performed.

5.9.6. Initiate intravenous (IV) therapy, blood withdrawal and arterial puncture using various

techniques (e.g., butterfly, vacutainer, syringe, capillary puncture) according to current

Occupational Safety and Health Administration (OSHA), Centers for Disease Control (CDC),

Clinical Lab Improvement Act (CLIA) and the National Committee for Clinical Laboratory

Standards (NCCLS) guidelines.

5.9.7. Identify resources needed for special procedures and demonstrate knowledge of special

phlebotomy collection procedures (e.g., phenylketonuria [PKU], galactosemia, blood

donations, blood cultures).

5.9.8. Differentiate between specimen collection, storage and handling techniques (e.g.,

temperature, light, time, humidity).

5.9.9. Determine order of draw and appropriate anticoagulants for ordered tests and correlate tube

stopper colors with tube additives and their actions.

5.9.10. Identify complications of venipuncture (e.g., patient fainting, short draw, inadequate

inversion, hemolysis, lack of blood flow, hematoma, petechia, nerve injury, mastectomy

issues).

5.9.11. Prepare peripheral blood smears and discuss testing volumes and methods for minimizing

excessive blood collection volumes.

5.9.12. Determine the general criteria for suitability of a specimen for analysis and reasons for specimen rejection and recollection.

5.9.13. Identify major routine tests performed in clinical lab sections (e.g., blood bank, chemistry, hematology, serology, microbiology, urinalysis).

5.9.14. Instruct patients/clients in the collection procedures for random, routine, non‐blood specimen collection (e.g., clean‐catch, mid‐stream urine, stool specimens, semen, or sputum for testing.)

5.9.15. Perform Clinical Laboratory Improvement Act (CLIA) waived tests (e.g., dipstick or tablet reagent urinalysis, blood glucose by glucose monitoring devices, ovulation tests, urine pregnancy tests).

5.9.16. Assist with preparations for non‐CLIA waived procedures.

*An “X” indicates that the pathway applies to the outcome.*

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Pathways** | X | Health Information Management | x | Medical Bioscience | X | Allied Health and Nursing | | | X | Exercise Science and Sports Medicine |
| **Green** |  | Green-specific |  | Context-dependent | | |  | Does not apply | | |

**Strand 6. Health Information Management**

Learners will demonstrate basic computer literacy, health information literacy and skills, confidentially and privacy of health records, information security and basic skills in the use of electronic health records.

**Outcome 6.1. Health Information Literacy**

Apply principles of systems operations used to capture, retrieve and maintain information from internal and external sources.

**Competencies**

6.1.1. Define health information management (HIM) and differentiate among data, information and

competency.

6.1.2. Differentiate between primary and secondary health data sources and databases.

6.1.3. Describe the principles of architecture, data standards, and use of health information systems.

6.1.4. Use health record data collection tools (e.g., electronic medical/health records, meaningful use, document templates).

6.1.5. Recognize standard data definitions, vocabularies, terminologies, nomenclatures (e.g., SNOMED‐CT), classifications (e.g., ICD-10, HCPCS, CPT) and relevant healthcare data sets (e.g.,OASIS, HEDIS, UHDDS) as used in the organization’s health information systems.

6.1.6. Differentiate between the types and content of patient health records and the data collected (e.g., paper‐based, electronic medical/health records, personal health records, clearinghouse).

6.1.7. Apply concepts of health record documentation requirements of external agencies and organizations (e.g., accrediting bodies, regulatory bodies, professional review organizations, licensure, reimbursement, discipline‐specific, evidence-based good practice).

6.1.8. Describe typical internal organizational health record documentation requirements, policies and procedures.

6.1.9. Explain how to apply policies and procedures to ensure organizational compliance with regulations and standards, including Medicare, Medicaid, and other third party payers.

*An “X” indicates that the pathway applies to the outcome.*

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Pathways** | X | Health Information Management | x | Medical Bioscience | X | Allied Health and Nursing | | | X | Exercise Science and Sports Medicine |
| **Green Practices** |  | Green-specific |  | Context-dependent | | |  | Does not apply | | |

**Outcome 6.2. Confidentiality, Privacy and Security**

Apply the fundamentals of confidentiality, privacy and security to communicate health/medical information accurately and within legal/regulatory bounds to other external entities.

**Competencies**

6.2.7. Describe the possible consequences of inappropriate use of health information.