**Course Description:**

In this course, students will identify the causes, processes, and changes in body organs and tissues that occur with human illness. Topics include identification of clinical characteristics and effects of diseases, mechanisms causing alterations in cellular activity, maintenance of cellular tissue oxygenation, fluid and electrolyte balance, neuroendocrine control of the body, and diagnostic methodology. Students will interpret and use clinical data and patient health history to assemble a comprehensive health assessment.

**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 and maintaining employment in diverse business settings.

**Competencies**

1.1.1. Identify the knowledge, skills and abilities necessary to succeed in careers.

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

certification, licensure and experience.

1.1.3. Develop a career plan that reflects career interests, pathways and secondary and

postsecondary options.

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.

1.1.5. Develop strategies for self‐promotion in the hiring process (e.g., filling out job applications,

résumé writing, interviewing skills, portfolio development).

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

associated behaviors in fulfilling personal, community and workplace roles.

1.1.7. Apply problem‐solving and critical‐thinking skills to work‐related issues when making decisions

and formulating solutions.

1.1.8. Identify the correlation between emotions, behavior and appearance and manage those to

establish and maintain professionalism.

1.1.9. Give and receive constructive feedback to improve work habits.

1.1.10. Adapt personal coping skills to adjust to taxing workplace demands.

1.1.11. Recognize different cultural beliefs and practices in the workplace and demonstrate respect

for them.

1.1.12. Identify healthy lifestyles that reduce the risk of chronic disease, unsafe habits and abusive

behavior.

*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 | X | Therapeutic Services |
| **Green Practices** |  | Green-specific |  | Context-dependent | | X | Does not apply | | |  |  |

**Outcome: 1.2. Leadership and Communications**

Process, maintain, evaluate and disseminate information in a business. Develop leadership and team building to promote collaboration.

**Competencies**

1.2.1. Extract relevant, valid information from materials and cite sources of information (e.g.,

medical reports, fitness assessment, medical test results).

1.2.2. Deliver formal and informal presentations.

1.2.3. Identify and use verbal, nonverbal and active listening skills to communicate effectively.

1.2.4. Use negotiation and conflict‐resolution skills to reach solutions.

1.2.5. Communicate information for an intended audience and purpose.

1.2.6. Use proper grammar and expression in all aspects of communication.

1.2.7. Use problem‐solving and consensus‐building techniques to draw conclusions and determine

next steps.

1.2.8. Identify the strengths, weaknesses and characteristics of leadership styles that influence

internal and external workplace relationships.

1.2.9. Characteristics of leadership styles that influence internal and external workplace relationships.

1.2.10. Use interpersonal skills to provide group leadership, promote collaboration and work in a

team.

1.2.11. Write professional correspondence, documents, job applications and resumés.

*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 | X | Therapeutic Services |
| **Green Practices** |  | Green-specific |  | Context-dependent | | X | Does not apply | | |  |  |

**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**

1.3.2. 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).

1.3.7. Identify the labor and practice laws that affect employment and the consequences of

noncompliance for both employee and employer (e.g., harassment, labor, employment,

employment interview, testing, minor labor laws, Americans with Disabilities Act, Fair Labor

Standards Acts, Equal Employment Opportunity Commission [EEOC], human trafficking) and

interpret personal safety rights according to the employee Right‐to‐Know Plan.

1.3.8. Verify compliance with computer and intellectual property laws and regulations.

1.3.9. Identify potential conflicts of interest (e.g., personal gain, project bidding) between personal,

organizational and professional ethical standards.

*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 | X | Therapeutic Services |
| **Green Practices** |  | Green-specific |  | Context-dependent | | X | Does not apply | | |  |  |

**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**

1.4.1. Use office equipment to communicate (e.g., phone, radio equipment, fax machine, scanner,

public address systems).

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.

1.4.7. Use personal information management and productivity applications to optimize assigned

tasks (e.g., lists, calendars, address books).

*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 | X | Therapeutic Services |
| **Green Practices** |  | Green-specific |  | Context-dependent | | X | Does not apply | | |  |  |

**Outcome: 1.5. Global Environment**

Evaluate how beliefs, values, attitudes and behaviors influence organizational strategies and goals.

**Competencies**

1.5.1. Describe how cultural understanding, cultural intelligence skills and continual awareness are

interdependent.

1.5.3. Use cultural intelligence to interact with individuals from diverse cultural settings.

1.5.4. Recognize barriers in cross‐cultural relationships and implement behavioral adjustments.

1.5.5. Recognize the ways in which bias and discrimination may influence productivity and

profitability.

*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 | X | Therapeutic Services |
| **Green Practices** |  | Green-specific |  | Context-dependent | | X | Does not apply | | |  |  |

**Outcome: 1.6. Business Literacy**

Develop foundational skills and knowledge in entrepreneurship, financial literacy and business operations.

**Competencies**

1.6.9. Explain how the performance of an employee, a department and an organization is assessed.

1.6.11. Describe how all business activities of an organization work within the parameters of a

budget.

1.6.12. Describe classifications of employee benefits, rights, deductions and compensations.

*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 | X | Therapeutic Services |
| **Green Practices** |  | Green-specific |  | Context-dependent | | X | Does not apply | | |  |  |

**Strand 2. Human Body System**

Learners will describe the various anatomy, physiology, and pathophysiology associated with body systems and alterations related to the normal developmental process, obtain a health history, perform an evaluation of the body systems, and document using medical terminology.

**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.

2.1.15. Explain the pathophysiology changes associated with or resulting from disease or injury for 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 | X | Therapeutic Services |
| **Green Practices** |  | Green-specific |  | Context-dependent | | X | 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.

2.2.6. Identify and measure pupil reactivity and accommodation.

2.2.7. Identify site, onset, type, quality and degree of pain.

2.2.8. Identify factors affecting degree and quality of pain.

2.2.9. Auscultate lungs for abnormal breath sounds.

2.2.10. Describe pulmonary function testing (e.g., vital capacity, tidal volumes, total lung capacity).

2.2.11. Auscultate bowel sounds and palpate abdomen for distention and tautness.

2.2.12. Measure range of motion and determine joint mobility.

2.2.13. Measure muscle strength.

2.2.14. Identify various wounds and skin conditions.

2.2.15. Measure and document excessive body fluid loss.

2.2.16. Identify symptoms of substance abuse.

2.2.17. Identify patterns of behavior that indicate risk to self and others.

*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 | X | Therapeutic Services |
| **Green Practices** |  | Green-specific |  | Context-dependent | | X | 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** |  | Health Information Management | X | Medical Bioscience | X | Allied Health and Nursing | | X | Exercise Science and Sports Medicine | X | Therapeutic Services |
| **Green Practices** |  | Green-specific |  | Context-dependent | | X | 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.

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

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

**Outcome 3.2. Health Promotion Interventions**

Identify and communicate health promotion and wellness to individuals, support systems, and communities.

**Competencies**

3.2.1. Describe the national and state health agenda for wellness.

3.2.4. Identify the needs of the individual, support system, and community related to physical, biological, technological, spiritual, religious, social and behavioral wellness.

3.2.5. Communicate relevant information to promote, maintain and restore overall wellness.

3.2.6. Communicate the medical benefits and risks associated with immunizations and other preventative care across the life span.

3.2.8. Communicate the relationship between dimensions of health and wellness.

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

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

**Outcome 3.3. Pharmaceutical Interventions**

Prepare, administer, store and document medications, reactions and outcomes according to laws, regulations and authorized health care provider orders and protocols.

**Competencies**

3.3.13. Identify altered mental states (e.g., hallucinogens, sensory deprivation) and corrective actions.

3.3.14. Identify fluid and electrolyte imbalances, side‐effects and adverse reactions.

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

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Pathways** |  | Health Information Management | X | Medical Bioscience | X | Allied Health and Nursing | | X | Exercise Science and Sports Medicine | X | Therapeutic Services |
| **Green Practices** |  | Green-specific |  | Context-dependent | | X | 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 healthcare provider cardiopulmonary resuscitation (CPR) and automated external defibrillation (AED).

3.4.2. Recognize rescuer duties, victim and rescuer safety

3.4.3. Recognize and treat breathing problems.

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

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

**Outcome 3.5. Nutritional Interventions**

Identify nutritional needs and communicate information to the individual and support system.

**Competencies**

3.5.1. Describe the role and effects of carbohydrates, proteins, fats, electrolytes, minerals, vitamins and water in body systems.

3.5.2. Calculate the energy of carbohydrates, proteins and fats.

3.5.3. Describe nutritional supplements and ergogenic aids and potential effects.

3.5.4. Calculate caloric needs of the individual and refer the individual to nutritional resources for optimal health and performance.

3.5.5. Provide diet and hydration guidelines to maintain optimal health.

3.5.7. Describe types of allergic reactions to foods and food intolerances.

3.5.8. Describe regional, cultural and religious food preferences.

3.5.9. Monitor nutritional intake and output.

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

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

**Outcome 3.6. Exercise and Rehabilitative Intervention**

Evaluate, define and perform training, and document therapies to enhance mobility and muscle strength.

**Competencies**

3.6.7. Identify aquatic exercises for improvement of ROM, strength and cardiovascular benefits.

3.6.9. Fit ambulatory aids and perform gait training.

3.6.10. Apply protective taping, wrapping, padding and protective equipment to upper and lower extremities.

3.6.12. Apply evidence‐based therapeutic interventions (e.g., cryotherapy, thermotherapy, hydrotherapy, light therapy, electrotherapy).

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

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

**Strand 4. Assistive Care**

Learners will demonstrate the skills and knowledge to provide personal assistive care for the activities of daily living to a variety of individuals across the life span 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 healthcare settings.

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

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

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

**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).

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

**Outcome 4.4. Hygiene**

Perform personal hygiene for individuals across stages of development and document.

**Competencies**

4.4.1. Perform oral and denture care.

4.4.2. Perform personal hygiene.

4.4.3. Dress and undress individuals in need of assistance.

4.4.4. Perform nail care and foot soaks.

4.4.5. Observe and report skin condition for abnormalities.

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

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

**Outcome 4.5. Ambulation and Mobility**

Assist and document the safe ambulation and mobility of individuals across stages of development.

**Competencies**

4.5.1. Describe risks of immobilization and take measures to prevent complications.

4.5.2. Educate and monitor use of assistive devices based on individual needs.

4.5.3. Operate wheelchairs, Geri Chairs and lifts.

4.5.4. Educate an individual for ambulation with skid‐proof footwear, use gait belt and encourage the individual to use assistive devices.

4.5.5. Reposition slowly to avoid adverse outcomes.

4.5.6. Support the individual to prevent falls or injury.

4.5.7. Position the individual in bed for comfort, proper body alignment, and decreased pressure on boney prominences.

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

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

**Outcome 4.6. Elimination**

Assist with elimination needs across the stages of development and document.

**Competencies**

4.6.1. Describe changes in elimination related to the aging process.

4.6.2. Measure intake and output.

4.6.3. Describe the importance of and develop a toileting schedule to maintain the individual’s

dignity prevent falls and decrease skin irritation.

4.6.4. Identify signs and symptoms of abnormalities in elimination.

4.6.5. Assist with elimination needs.

4.6.6. Maintain a closed artificial elimination collection system (e.g., catheter, colostomy, iliaostomy) and monitor, recognize, and report abnormalities.

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

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

**Outcome 4.7. End‐of‐Life Care**

Provide physical, emotional and spiritual support to individuals and support systems at end‐of‐life.

**Competencies**

4.7.1. Describe variations in advanced directives and responsibilities of healthcare providers.

4.7.2. Identify stages of reaction to death and dying.

4.7.4. Provide resources for an individual’s cultural, spiritual and religious needs.

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

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

**Strand 5. Bioscience Research and Development**

Learners will demonstrate the skills and knowledge of interpreting laboratory requests, using personal protective equipment 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).

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

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Pathways** |  | Health Information Management | X | Medical Bioscience | X | Allied Health and Nursing | |  | Exercise Science and Sports Medicine |  | Therapeutic Services |
| **Green Practices** |  | Green-specific |  | Context-dependent | | X | 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. Convert units of measure from English to metric and vice versa.

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

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

**Outcome 5.7. Fermentation Technology**

Describe and perform fermentation procedures.

**Competencies**

5.7.13. Monitor microorganism growth and determine the viability of cells.

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

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Pathways** |  | Health Information Management | X | Medical Bioscience | X | Allied Health and Nursing | |  | Exercise Science and Sports Medicine | X | Therapeutic Services |
| **Green Practices** |  | Green-specific |  | Context-dependent | | X | 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).

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

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).

*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 | X | Therapeutic Services |
| **Green Practices** |  | Green-specific |  | Context-dependent | | X | Does not apply | | |  |  |

**Strand 6. Health Information Management**

Learners will demonstrate basic computer literacy, health information literacy and skills, confidentiality 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.

6.1.7. 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.

*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 | X | Therapeutic Services |
| **Green Practices** |  | Green-specific |  | Context-dependent | | X | 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**

6.2.1. Identify components of the legal system.

6.2.4. Identify what constitutes the authorized access, release and use of personal health information.

6.2.5. Distinguish confidential and non‐confidential information, and document and prioritize requests for personal health information according to privacy and confidentiality guidelines.

6.2.8. Implement administrative, physical and technical safeguards to maintain data integrity and validity.

*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 | X | Therapeutic Services |
| **Green Practices** |  | Green-specific |  | Context-dependent | | X | Does not apply | | |  |  |

**Outcome 6.3. Electronic Health Records and Coding**

Perform functions within electronic health records (EHRs) and electronic medical records (EMRs) to ensure accurate information, retrieve information and maintain data.

**Competencies**

6.3.1. Create and update documents within the electronic health record and electronic health systems.

6.3.2. Locate and retrieve information in the electronic medical/health records and other sources.

6.3.3. Input and use health information applying management principles to ensure quality, compliance, and integrity.

6.3.6. Access and apply reference material available through an electronic health/medical record or other reference 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 | X | Therapeutic Services |
| **Green Practices** |  | Green-specific |  | Context-dependent | | X | Does not apply | | |  |  |