

Kentucky PLTW Biomedical Science

Biomedical Innovation

Foundation Standard 1:
Academic Foundation:
Understand human
anatomy, physiology,
common diseases and
disorders, and medical
math principles. BI1

1.1.2 Identify basic structures and describe functions of human body systems. BI112

1.1.2 a Skeletal BI112A

- A** Structures of the skeletal system BI112AA
 - i Distinguish between axial and appendicular skeletons BI112AAI
 - ii Describe long bone anatomy BI112AAII
 - iii Identify joint types and movement BI112AAIII
 - iv Name and classify all bones (206) BI112AAIV
- B** Functions of the skeletal system BI112AB
 - i Structure and support BI112ABI
 - ii Muscle attachment and movement BI112ABII
 - iii Mineral storage BI112ABIII
 - iv Hematopoiesis BI112ABIV

1.1.2 b Muscular BI112B

- A** Structures of the muscular system BI112BA
 - i Identify types of muscle tissue BI112BAI
 - ii Identify major muscle groups of neck, shoulder, chest, abdomen, back, arms, and legs BI112BAII
- B** Functions of the muscular system BI112BB
 - i Body movement BI112BBI
 - ii Posture BI112BBII
 - iii Protection BI112BBIII

1.1.2 c Integumentary BI112C

- A** Structures of the integumentary system BI112CA
 - i Identify integumentary components BI112CAI
 - ii Label the layers of skin BI112CAII
- B** Functions of the integumentary system BI112CB
 - i Vitamin D production BI112CBI
 - ii Sensory organ BI112CBII
 - iii Infection protection BI112CBIII
 - iv Temperature regulation BI112CBIV
 - v UV light protection BI112CBV

1.1.2 d Cardiovascular BI112D

- A** Structures of the cardiovascular system BI112DA
 - i Identify cardiovascular organs BI112DAI

- ii Label the parts of the heart [BI112DAII](#)
 - iii Distinguish blood components [BI112DAIII](#)
- B Functions of the cardiovascular system [BI112DB](#)
 - i Blood flow through the heart and body [BI112DBI](#)
 - ii Transports nutrients, waste, antibodies, hormones, and gases [BI112DBII](#)
 - iii Cardiac conduction system [BI112DBIII](#)
- 1.1.2 e Lymphatic / Immune [BI112E](#)
 - A Structures of the lymphatic system [BI112EA](#)
 - i Identify lymphatic organs [BI112EAI](#)
 - B Functions of the lymphatic system [BI112EB](#)
 - i Provide protection against disease [BI112EBI](#)
 - ii Movement of lymph fluid [BI112EBII](#)
- 1.1.2 f Respiratory [BI112F](#)
 - A Structures of the respiratory system [BI112FA](#)
 - i Identify respiratory organs [BI112FAI](#)
 - B Functions of the respiratory system [BI112FB](#)
 - i Gas exchange [BI112FBI](#)
- 1.1.2 g Nervous System [BI112G](#)
 - A Structures of the nervous system [BI112GA](#)
 - i Identify organs of the nervous system [BI112GAI](#)
 - ii Identify structures of the special sense organs [BI112GAI](#)
 - B Functions of the nervous system [BI112GB](#)
 - i Sensation [BI112GBI](#)
 - ii Movement [BI112GBII](#)
 - iii Processing [BI112GBIII](#)
- 1.1.2 h Endocrine [BI112H](#)
 - A Structures of the endocrine system [BI112HA](#)
 - i Identify endocrine glands [BI112HAI](#)
 - B Functions of the endocrine system [BI112HB](#)
 - i Production of hormones [BI112HBI](#)
 - ii Regulation of body processes [BI112BBII](#)
 - iii Controls metabolism [BI112BBIII](#)
 - iv Regulates growth, development, and maturation [BI112BBIV](#)
- 1.1.2 i Digestive [BI112I](#)

- A Structures of the digestive system **BI112IA**
 - i Identify digestive organs in sequence **BI112IAI**
 - ii Differentiate between alimentary and accessory organs **BI112IAII**
- B Functions of the digestive system **BI112IB**
 - i Chemical and mechanical digestion **BI112IBI**
 - ii Absorption of nutrients **BI112IBII**
 - iii Excretion of waste **BI112IBIII**

1.1.2 j Urinary **BI112J**

- A Structures of the urinary system **BI112JA**
 - i Identify urinary organs **BI112JAI**
 - ii Identify gross and microscopic anatomy of the kidney **BI112JAI**
- B Functions of the urinary system **BI112JB**
 - i Process of urine formation **BI112JBI**
 - ii Urine composition **BI112JBII**
 - iii Homeostatic balance **BI112JBIII**

1.1.2 k Reproductive **BI112K**

- A Structures of the reproductive system **BI112KA**
 - i Identify female reproductive organs **BI112KAI**
 - ii Identify male reproductive organs **BI112KAII**
- B Functions of the reproductive system **BI112KB**
 - i Formation of gametes **BI112KBI**
 - ii Production of hormones **BI112KBII**

1.2.2 Describe biomedical therapies as they relate to the prevention, pathology, and treatment of disease. **BI122**

- A Gene testing **BI122A**
- B Gene therapy **BI122B**
- C Cloning **BI122C**
- D Stem cell research **BI122D**

1.3.1 Demonstrate competency using basic math skills and mathematical conversions as they relate to healthcare. BI131

1.3.1 a Metric system BI131A

- A Kilo- BI131AA
- B Centi- BI131AB
- C Deci- BI131AC
- D Milli- BI131AD
- E Micro- BI131AE

1.3.1 b Mathematical BI131B

- A Average BI131BA
- B Ratios BI131BB
- C Fractions BI131BC
- D Percentages BI131BD
- E Addition/Subtraction BI131BE
- F Multiplication/Division BI131BF

1.3.1 c Conversions BI131C

- A Height (inches/meters) BI131CA
- B Weight (pounds/grams) BI131CB
- C Length (inches/meters) BI131CC
- D Volume (ml/cc) BI131CD
- E Temperature (F/C) BI131CE
- F Household measurements (Tbsp/tsp/cup/oz) BI131CF

1.3.2 Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results. BI132

Identify basic levels of organization of the human body BI111A

- A Chemical** BI111AA
 - B Cellular** BI111AB
 - C Tissue** BI111AC
 - D Organs** BI111AD
 - E Systems** BI111AE
 - F Organism** BI111AF
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Foundation Standard 2: Communications
Demonstrate methods of delivering and obtaining information, while communicating effectively. BI2

2.1.1 Model verbal and nonverbal therapeutic communication. BI211

- A Active listening BI211A
- B Silence BI211B
- C Summarizing BI211C
- D Reflecting BI211D

2.1.3 Distinguish between subjective and objective information. BI213

2.1.5 Modify communication to meet the needs of the patient/client and be appropriate to the situation. BI215

2.3.1 Use proper elements of written and electronic communication (spelling, grammar, and formatting). BI231

2.3.2 Prepare examples of technical and informative writing. BI232

Foundation Standard 4: Employability Skills
Use employability skills to enhance employment opportunities and job satisfaction. BI4

4.2.1 Apply employability skills in healthcare. BI421

- A Chain of command BI421A
- B Communication Skills BI421B
- C Decision making BI421C
- D Flexible BI421D
- E Organization BI421E
- F Problem Solving BI421F
- G Scope of practice BI421G
- H Time Management BI421H
- I Work Ethic BI421I

4.4.1 Develop components of a personal portfolio. BI442

- A Letter of introduction BI441A
 - B Resume BI441B
 - C Sample Projects BI441C
 - D Writing Sample BI441D
 - E Work-based Learning Documentation BI441E
 - F Oral Report BI441F
 - G Community Service/Service Learning BI441G
 - H Credentials BI441H
 - I Technology Skills BI441I
 - J Leadership Examples BI441J
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**Foundation Standard 7:
Safety Practices Identify
existing and potential
hazards to clients,
coworkers, and self.
Employ safe work
practices and follow
health and safety
policies and procedures
to prevent injury and
illness. BI7**

7.1.1 Explain principles of infection transmission. BI711

7.1.1 a Identify classifications of pathogens BI711A

- A Bacteria BI711AA
- B Fungi BI711AB
- C Parasites BI711AC
- D Protozoa BI711AD
- E Viruses BI711AE

7.1.1 b Describe characteristics of microorganisms BII711B

- A Aerobic BI711BA
- B Anaerobic BI711BB
- C Non-pathogenic BI711BC
- D Pathogenic BI711BD

7.1.1 c Recognize chain of infection BI711C

7.1.1 d Describe mode of transmission BI711D

- A Common vehicle (air, food, water) BI711DA
- B Direct BI711DB
- C Healthcare-associated infections (nosocomial) BI711DC
- D Indirect BI711DD
- E Opportunistic BI711DE
- F Vectors BI711DF

7.1.2 Differentiate methods of controlling the spread and growth of pathogens. BI712

7.1.2 a Asepsis BI712A

- A Sanitization BI712AA
- B Antisepsis BI712AB
- C Disinfection BI712AC
- D Sterile technique BI712AD
- E Sterilization BI712AE

7.1.2 b Standard precautions BI712B

- A Handwashing BI712BA
- B Gloving BI712BB
- C Personal Protective Equipment (PPE) BI712BC
- D Environmental cleaning BI712BD

7.1.2 c Isolation precautions BI712C

- A Transmission-based contact BI712CA

7.1.2 d Bloodborne pathogen precautions BI712D

7.1.2 e Vaccinations BI712E

7.2.1 Apply personal safety procedures based on Occupational Safety and Health Administration (OSHA) and Centers for Disease Control (CDC) regulations. BI721

7.2.2 Demonstrate principles of body mechanics during patient care. BI722

- A Ambulating BI722A
- B Lifting BI722B
- C Positioning BI722C

7.2.3 Demonstrate and apply the use of personal protective equipment (PPE). BI723

7.3.1 Apply safety techniques in the work environment. BI731

- A Ergonomics BI731A
- B Safe operation of equipment BI731B
- C Patient/client/employee safety measures BI731C

7.4.1 Observe all safety standards related to the occupational exposure to hazardous chemicals standard (safety data sheets [SDS]). BI741

7.4.2 Comply with safety signs, symbols, and labels. BI742

Foundation Standard 8: Teamwork Identify roles and responsibilities of individual members as part of the healthcare team. **BI8**

8.1.2 Identify characteristics of effective teams. **BI812**

- A** Defined roles **BI812A**
 - B** Common purpose **BI812B**
 - C** Effective communication **BI812C**
 - D** Effective leadership **BI812D**
 - E** Measurable processes and outcomes **BI812E**
 - F** Mutual respect **BI812F**
 - G** Shared goals **BI812G**
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8.2.1 Recognize methods for building positive team relationships. **BI821**

8.2.2 Analyze attributes and attitudes of an effective leader. **BI822**

8.2.2 a Characteristics **BI822A**

- A** Focused and driven **BI822AA**
- B** Interpersonal skills **BI822AB**
- C** Motivates and inspires **BI822AC**
- D** Organized and balance **BI822AD**

8.2.2 b Types **BI822B**

- A** Autocratic **BI822BA**
- B** Democratic **BI822BB**
- C** Laissez faire **BI822BC**

8.2.2 c Roles **BI822C**

- A** Communicates vision **BI822CA**
 - B** Leads change **BI822CB**
 - C** Manages accountability **BI822CC**
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8.2.3 Apply effective techniques for managing team conflict. **BI823**

- A** Communicate assertively **BI823A**
 - B** Set clear expectations **BI823B**
 - C** Gather the facts **BI823C**
 - D** Mediate disputes **BI823D**
 - E** Negotiate resolutions **BI823E**
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Foundation Standard 9: Health Maintenance Practices Differentiate between wellness and disease. Promote disease prevention and model healthy behaviors. BI9

9.1.1 Promote behaviors of health and wellness. BI911

- A Exercise BI911A
 - B Nutrition BI911B
 - C Relationships BI911C
 - D Sleep habits BI911D
 - E Stress management BI911E
 - F Weight control BI911F
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9.1.3 Describe strategies for prevention of disease. BI913

- A Community health education outreach programs BI913A
 - B Immunizations BI913B
 - C Medical, dental, and mental health screenings BI913C
 - D Routine physical exams BI913D
 - E Stress management BI913E
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Foundation Standard 10: Technical Skills Apply and demonstrate technical skills and knowledge common to health career specialties. BI10

10.1.1 Demonstrate procedures for measuring and recording vital signs including the normal ranges. BI1011

- A Blood pressure BI1011A
- B Temperature BI1011B
- C Oxygen saturation BI1011C
- D Pain BI1011D
- E Pulse BI1011E
- F Respirations BI1011F