Chapter 1- The Human body: An orientation

I. The human body- an orientation
    A. Anatomy
        1. Study of the structure and shape of the body and its parts
    B. Physiology
        1. Study of how the body and its parts work or function

II. Anatomy- levels of study
    A. Gross anatomy
        1. Large structures
        2. Easily observable
    B. Microscopic anatomy
        1. Very small structures
        2. Can only be viewed with a microscope

III. Levels of structural organization
    A. Atoms
    B. Cells
    C. Tissues
    D. Organ
    E. Organ system overview
        1. Integumentary
            a. forms the external body covering
            b. Protects deeper tissue from injury
            c. Helps regulate body temperature
            d. Location of cutaneous nerve receptors
        2. Skeletal
            a. Protects and supports body organs
            b. Provides muscle attachment for movement
            c. Site of blood cell formation
            d. Stores minerals
        3. Muscular
            a. Produces movement
            b. Maintains posture
            c. Provides heat
        4. Nervous
            a. Fast-acting control system
            b. Responds to internal and external change
            c. Activates muscles and glands
        5. Endocrine
            a. Secretes regulatory hormones
            b. Growth
            c. Reproduction

        d. Metabolism
    6. Cardiovascular
        a. transports materials in body via blood pumped by heart
            1) Oxygen
            2) Carbon Dioxide
            3) Nutrients
            4) Wastes
    7. Lymphatic
        a. Returns fluids to blood vessels
        b. Cleanses the blood
        c. Involved in immunity
    8. Respiratory
        a. Keeps blood supplied with oxygen
        b. Removes carbon dioxide
    9. Digestive
        a. Breaks down food
        b. Allows for nutrient absorption into blood
        c. Eliminates indigestible material
    10. Urinary
        a. Eliminates nitrogenous wastes
        b. Maintains acid-base balance
        c. Regulates water and electrolytes
    11. Reproductive
        a. Produces offspring

IV. Necessary Life Functions
- A. Maintains boundaries
- B. Movement
    1. Locomotion
    2. Movement of substances
- C. Responsiveness
    1. Ability to sense changes and react
- D. Digestion
    1. Breakdown and absorption of nutrients
- E. Metabolism-chemical reactions within the body
    1. produces energy
    2. Makes body structures
- F. Excretion
    1. Eliminates waste from metabolic reactions
- G. Reproduction
    1. Produces future generation
- H. Growth
    1. Increases cell size and number of cells

V. Survival needs
    A. Nutrients
        1. Chemicals for energy and cell building
            a. Includes carbohydrates, proteins, lipids, vitamins, and minerals
            b. Oxygen
        2. Required for chemical reactions
    B. Water
        1. 60-80% of body weight
        2. Provides for metabolic reaction
        3. Stable body temperature
    C. Atmospheric pressure
        1. Must be appropriate

VI. Interrelationships among body systems
    A. Homeostasis
        1. Homeostasis-maintenance of a stable environment
            a. A dynamic state of equilibrium
            b. Homeostasis is necessary for normal body functioning and to sustain life
            c. Homeostatic imbalance
                1) A disturbance in homeostasis resulting in disease
        2. Maintaining homeostasis
            a. The body communicates through neural and hormonal control systems
                1) Receptor
                    a) Responds to changes in the environment (stimuli)
                    b) Sends information to control center
                2) Control center
                    a) Determines set point
                    b) Analyzes information
                    c) Determines appropriate response
                3) Effector
                    a) Provides a means for response to the stimulus
        3. Feedback mechanisms
            a. Negative feedback
                1) Includes most homeostatic control mechanisms
                2) Shuts off the original stimulus, or reduces the intensity
                3) Works like a household thermostat
            b. Positive feedback
                1) Increases the original stimulus to push the variable farther
                2) In the body this only occurs in blood clotting and during the birth of a baby

VII. The language of anatomy
    A. Special terminology is used to prevent misunderstanding
        1. Exact terms are used for

        a. Position
        b. Direction
        c. Regions
        d. Structures
B. Regional terms
    1. Anterior body landmarks
    2. Posterior body landmarks
C. Directional terms
D. Body planes and sections
    1. A sagittal section divides the body (or organ) into left and right parts
    2. A median, or midsagittal, section divides the body (or organ) into equal left and right parts
    3. A frontal section divides the body (or organ) into anterior and posterior parts
    4. A transverse, or cross, section divides the body (or organ) into superior and inferior parts
E. Body cavities
    1. Dorsal body cavity
        a. Cranial cavity houses the brain
        b. Spinal cavity houses the spinal cord
    2. Ventral body cavity
        a. Thoracic cavity houses the heart, lungs and others
        b. Abdominopelvic cavity houses digestive system and most urinary system organs
F. Abdominopelvic quadrants
G. Abdominopelvic regions
H. Abdomiopelvic major organs