BIO-1050: HUMAN BIOLOGY

Cuyahoga Community College

Viewing:BIO-1050 : Human Biology
Board of Trustees:
2018-06-28

Academic Term:
Fall 2018

Subject Code
BIO - Biology

Course Number:
1050

Title:
Human Biology

Catalog Description:
Designed for non-science majors. Considers concept of homeostasis of the human body. Basic structure and function of body systems and diseases of these systems studied. To fulfill laboratory science requirements, students should enroll in related laboratory course.

Credit Hour(s):
3

Lecture Hour(s):
3

Lab Hour(s):
0

Other Hour(s):
0

Requisites
Prerequisite and Corequisite
ENG-0990 Language Fundamentals II, or appropriate score on English Placement Test.

I. ACADEMIC CREDIT

Academic Credit According to the Ohio Department of Higher Education, one (1) semester hour of college credit will be awarded for each lecture hour. Students will be expected to work on out-of-class assignments on a regular basis which, over the length of the course, would normally average two hours of out-of-class study for each hour of formal class activity. For laboratory hours, one (1) credit shall be awarded for a minimum of three laboratory hours in a standard week for which little or no out-of-class study is required since three hours will be in the lab (i.e. Laboratory 03 hours). Whereas, one (1) credit shall be awarded for a minimum of two laboratory hours in a standard week, if supplemented by out-of-class assignments which would normally average one hour of out-of-class study preparing for or following up the laboratory experience (i.e. Laboratory 02 hours). Credit is also awarded for other hours such as directed practice, practicum, cooperative work experience, and field experience. The number of hours required to receive credit is listed under Other Hours on the syllabus. The number of credit hours for lecture, lab and other hours are listed at the beginning of the syllabus. Make sure you can prioritize your time accordingly. Proper planning, prioritization and dedication will enhance your success in this course.

The standard expectation for an online course is that you will spend 3 hours per week for each credit hour.

II. ACCESSIBILITY STATEMENT

If you need any special course adaptations or accommodations because of a documented disability, please notify your instructor within a reasonable length of time, preferably the first week of the term with formal notice of that need (i.e. an official letter from the Student Accessibility Services (SAS) office). Accommodations will not be made retroactively.
Use the principles of the scientific method to analyze questions arising in daily life.

Course Outcome(s):

Outcomes

Use the principles of the scientific method to analyze questions arising in daily life.
Objective(s):
1. List the steps of the scientific method in order.
2. Define hypothesis and differentiate between a hypothesis and prediction.
3. Explain what objective and subjective means as related to observations.
4. Demonstrate the use of the scientific method to solve problems in daily activities.

Course Outcome(s):
Compare and contrast anatomy and physiology and describe the organization of the human body.

Objective(s):
1. Define the terms anatomy and physiology.
2. Demonstrate the relationship between anatomy and physiology using specific examples.
3. Name the 11 organ systems and their basic functions.
4. Identify the major organs of the human body.
5. List, from simplest to most complex, the major levels of organization in the human body.

Course Outcome(s):
Describe the process of homeostasis and explain how the various body systems work together to maintain homeostasis.

Objective(s):
1. Define the components of a negative feedback loop in a specific example of homeostasis including the receptor, afferent directional information flow, control center, efferent directional information flow, and effector.
2. Predict the response of the body to factors that disrupt the internal parameters in order to maintain homeostasis.
3. Define the term homeostasis.
4. Give examples of variables in the body regulated by homeostasis.
5. List the components of a feedback loop and explain the function of each.
6. Compare and contrast the processes of positive and negative feedback.

Course Outcome(s):
Apply the fundamental knowledge of cell theory and membrane biology to human physiology.

Objective(s):
1. State the parameters of the cell theory.
2. Identify the three main parts of all human cells and list the general functions of each.
3. Describe the structure of the plasma membrane.
4. List the types and functions of proteins associated with the plasma membrane.
5. Illustrate the phospholipid bilayer and describe the structure of a phospholipid.
6. Explain why the plasma membrane is semipermeable and give examples of substances that can and cannot permeate the lipid bilayer.
7. Predict the net direction of movement of a substance across a cell membrane given the concentration of the substance inside and outside the cell and the permeability of the substance across the membrane.

Course Outcome(s):
Describe and differentiate between the four basic tissues that make up the human body.

Objective(s):
1. Define tissue.
2. List the four main types of tissue that make up the human body.
3. Compare and contrast the fundamental characteristics of the tissue types.
4. Identify the subtypes of a tissue by describing its function and location in the body.

Course Outcome(s):
Apply the fundamental knowledge of the integumentary system to its role in homeostasis.

Objective(s):
1. Define the term (integument) and describe the major functions of the integumentary system.
2. Identify and describe the two components of the cutaneous membrane and state which tissue type makes up each.
3. Identify and describe the five layers of the epidermis.
4. Describe the process of epidermal growth and keratinization.
5. Identify and describe the dermis and the composition of the tissue layer underneath the skin.
6. Identify and describe the accessory structures of the integumentary system, including the hair, arrector pili muscle, nails, and glands.
7. Explain how the integumentary system maintains homeostasis of body temperature.
8. Predict how damage to the skin could disrupt homeostasis in the body.

Course Outcome(s):
Apply the fundamental knowledge of the skeletal system and articulations to their role in homeostasis.

Objective(s):
1. Describe the major functions of the skeletal system.
2. Describe the composition of compact bone and spongy bone tissue.
3. Identify the major structural components of a long bone relative to the function of the bone in the body.
4. Identify the major bones of the axial and appendicular skeleton, and the location of each in the body.
5. Identify examples of the six synovial joints in the human body.
6. Describe and demonstrate the movements at the six synovial joints in the human body.
7. Describe disorders of the skeletal system.

Course Outcome(s):
Apply the fundamental knowledge of the muscular system to explain homeostasis.

Objective(s):
1. Describe the major functions of the muscular system.
2. Describe the composition of compact bone and spongy bone tissue.
3. Identify the major structural components of a long bone relative to the function of the bone in the body.
4. Identify examples of the six synovial joints in the human body.
5. Describe and demonstrate the movements at the six synovial joints in the human body.
6. Describe disorders of the skeletal system.

Course Outcome(s):
Apply the fundamental knowledge of the nervous system to explain homeostasis.

Objective(s):
1. Describe the major functions of the nervous system.
2. Describe the hierarchical organization of the nervous system including the central, peripheral, sensory, motor, somatic, and autonomic nervous systems.
3. List the parts of the nervous system that constitute the central nervous system (CNS) and those that constitute the peripheral nervous system (PNS).
4. Define afferent and efferent as these terms relate to components of the PNS and information flow to and from the CNS.
5. Describe the two types of cells found in nervous tissue and state their function.
6. Identify and state the function of the parts of a neuron including the dendrite, axon hillock, axon, and axon terminal.
7. Classify neurons based on structure (unipolar, bipolar or multipolar) and function (motor, sensory or interneuron).
8. Describe the location of a motor, sensory, and interneuron within the nervous system.
9. Define the term myelin and explain its function.
10. Define membrane potential and explain its significance in nervous system function.
11. Describe how the diffusion of ions across the plasma membrane is regulated by gated ion channels.
12. Define excitation, depolarization, re-polarization, as they relate to changes in membrane potential.
13. Describe how an action potential passes from the presynaptic membrane to the postsynaptic membrane.
14. Define the components and function of the central nervous system.
15. Compare and contrast white matter and gray matter in the central nervous system anatomically and functionally.
16. Identify the major regions of the brain and describe the function of each.
17. Describe the effect of drugs and drug abuse on the nervous system.
Course Outcome(s):
Apply the fundamental knowledge of the special senses to explain homeostasis.

Objective(s):
1. List the five special senses in the human body and describe the location of the specialized sensory organ housing the sensory receptors for each.
2. Describe signal transduction in the retinal cells during light and dark.
3. Trace the pathway of visual input from the retina to the occipital lobe.
4. Describe the part of the inner ear that detects sound waves and equilibrium and trace the pathway of a sound wave from the outer ear to the cochlea.
5. Describe how a sound wave inside the cochlea activates a hair cell.
6. Describe how the amplitude and frequency of a sound wave traveling in the cochlea will determine the volume and pitch of a sound.
7. Explain how odorants activate olfactory receptors.
8. Explain how dissolved chemicals activate taste receptors.
9. List the five primary taste sensations and describe how each is transduced at the molecular level by the receptor.
10. Predict how loss of any of the special senses would disrupt homeostasis.

Course Outcome(s):
Apply the fundamental knowledge of the endocrine system to explain homeostasis.

Objective(s):
1. Explain the difference between an endocrine and exocrine gland.
2. Compare and contrast the nervous and endocrine systems as the two major control systems in the body.
3. Describe the characteristics of hormones and how they are classified.
4. List the three signals that can trigger hormone secretion.
5. Describe how hormone levels in the blood are regulated via positive or negative feedback.
6. Describe the two basic types of hormone receptors and how they generally alter cell function when a hormone is bound.
7. List the major structures of the endocrine system.
8. Analyze symptoms and hormone levels to diagnose common endocrine disorders.

Course Outcome(s):
Apply basic knowledge of the cardiovascular system structures and functions to explain homeostasis and to predict outcomes of disruption within the system.

Objective(s):
1. Relate the electrical and mechanical events of cardiac cycle to heart anatomy.
2. Describe the functions of blood vessels.
3. Compare and contrast the structure of arteries, arterioles, capillaries, veins, and venules, and relate their structure to their functions.
4. Describe the exchange of materials in capillary beds (diffusion).
5. Define systolic and diastolic pressure.
6. List the functions of blood.
7. Describe the composition of blood.
8. Describe the structures and functions of the formed elements: red blood cells, granular leukocytes (basophils, eosinophils, and neutrophils), agranular leukocytes (lymphocytes and monocytes), and platelets.
9. Describe disorders of each formed element.
10. Define hematopoiesis and describe the origin and production of the different formed elements.
11. Describe the chemical composition and biological functions of plasma.
12. Describe the ABO and Rh blood grouping systems, transfusion reactions, and hemolytic disease of the newborn.
13. Describe the functions of the heart.
14. Explain the location of the heart and its major blood vessels.
15. Describe the structures of the heart wall, chambers, and valves.
16. Outline the flow of blood through the heart, systemic, and pulmonary circulation, naming the correct chambers, valves, and vessels in chronological order.
17. Explain the functions of the cardiac conducting pathway.
18. Describe the main electrical events that occur during a normal electrocardiogram (ECG).
19. Explain common heart sounds and relate their timing to ECG events.

Course Outcome(s):
Apply basic knowledge of the lymphatic/immune system to explain homeostasis and to predict the outcomes of disruption within the system.
Objective(s):
1. Describe the functions of the lymphatic system.
2. List the structures of the lymphatic system.
3. Describe the location, structure, and function of primary immune tissues (red bone marrow and thymus).
4. Describe the location, structure, and function of secondary immune tissues and organs including tonsils, lymph nodes, spleen, and appendix.
5. Describe mechanisms of innate immunity including physical barriers, chemical mediators, and cells.
6. Describe the inflammatory response.
7. Describe mechanisms of cell-mediated adaptive immunity, including the cells and molecules necessary.
8. Describe mechanisms of antibody-mediated adaptive immunity, including the general structure of antibodies and the five classes of antibodies.
9. Explain the four ways to acquire adaptive immunity: natural passive, natural active, artificial passive, and artificial active adaptive immunity.
10. List disorders of the immune system.

Course Outcome(s):
Apply fundamental knowledge of the respiratory system to explain homeostasis and to predict outcomes of disrupted structure and/or function.

Objective(s):
1. Describe the functions of the respiratory system.
2. Describe the location, structure, and function of the components of the respiratory system, beginning at the nose and ending at the alveoli.
3. Define ventilation, external respiration, and internal respiration and describe events involved in each process.
4. Apply gas laws to inspiration and expiration and movement of gases.
5. Distinguish between the different types of pulmonary air volumes and capacities.
6. Define partial pressure and explain factors that affect movement of oxygen and carbon dioxide in the body.

Course Outcome(s):
Apply fundamental knowledge of the urinary system to explain homeostasis and to predict outcomes of disrupted structure and/or function.

Objective(s):
1. Describe functions of the urinary system.
2. Describe the location, structure, and functions of the components of the urinary system, beginning at the kidney and ending at the urethra.
3. Explain the location, structure, and functions of each region of a nephron.
4. Explain the blood supply to and from the kidney.
5. Discuss the process of urine formation.
6. Relate the structure of the kidney to its mechanisms to concentrate urine.
7. Compare how different hormones affect urine concentration and volume.
8. List the physical characteristics and normal chemical composition of urine and compare it to the normal chemical composition of plasma and filtrate.

Course Outcome(s):
Apply fundamental knowledge of the digestive system to explain homeostasis and to predict outcomes of disrupted structure and/or function.

Objective(s):
1. Describe the functions of the gastrointestinal tract.
2. Describe the location, structure, and functions of the components of the gastrointestinal tract, beginning at the mouth and ending at the anus.
3. Describe the histology of the gastrointestinal tract and name a function of each layer.
4. Describe the location, structure, and functions of the accessory organs of the digestive system, including salivary glands, liver, gallbladder, and pancreas.
5. Compare and contrast chemical and mechanical digestion.
6. Define a nutrient, describe the functions of the classes of nutrients, and state the enzyme(s) necessary to digest it, if applicable.
7. Describe the chemical composition and functions of the major secretions of the gastrointestinal tract and accessory organs, including saliva, bile, gastric acid, and pancreatic juices.
8. Define the various movements of the gastrointestinal tract.
Course Outcome(s):
Apply fundamental knowledge of the reproductive system to explain homeostasis and to predict outcomes of disrupted structure and/or function.

Objective(s):
1. Describe the functions of the male and female reproductive tracts.
2. Compare and contrast the location, structures, and functions of the components of the male and female reproductive systems.
3. Describe the processes of spermatogenesis and oogenesis.
4. Describe the endocrine system’s regulation of the anatomy and physiology of the male reproductive systems, including maturation at puberty, formation of sperm, and sex act.
5. Describe the sex hormones secreted by cells of the male and female reproductive systems, and their major effects on the body.
6. Describe the events in the ovarian and uterine cycles, including how hormones from the brain control the ovarian cycle and how hormones from the ovaries control the uterine cycle.
7. List the paths of sperm production and release in the male; oocyte production and release in the female; ejaculated sperm in the female; and fertilized oocyte in the female.
8. Discuss the structure and development of mammary glands and the endocrine system's control during lactation.

Methods of Evaluation:
1. Examinations
2. Quizzes
3. Participation in group learning activities
4. Written reports
5. Assignments/projects

Course Content Outline:
1. Introduction
   a. Scientific method
   b. Definitions
      i. Anatomy
      ii. Physiology
   c. Levels of organization
      i. Chemicals
      ii. Cells
      iii. Tissues
      iv. Organs
      v. Systems
      vi. Organisms
   d. Life processes
      i. Metabolism
      ii. Homeostasis
   e. Homeostasis
      i. Definition
      ii. Methods of maintaining
         1. Positive feedback
         2. Negative feedback
2. Cell Structure
   a. Cell (plasma) membrane
      i. Structure
         1. Phospholipid bilayer
         2. Proteins
      ii. Functions
   b. Cytoplasm
3. Tissues
   a. Epithelial tissue
      i. Characteristics
   ii. Types
      1. Squamous
      2. Cuboidal
      3. Columnar
   b. Connective tissue
i. Characteristics
ii. Types
   1. Connective tissue proper
   2. Loose (areolar)
   3. Adipose
   4. Dense (collagenous)
   5. Elastic
   6. Reticular
   7. Cartilage
   8. Hyaline
   9. Fibrocartilage
  10. Bone
  11. Blood
c. Muscular
   i. Characteristics
   ii. Types
      1. Smooth
      2. Skeletal
      3. Cardiac
d. Nervous
   i. Characteristics
   ii. Types
      1. Neurons
      2. Neuroglia

4. Integumentary System
   a. Functions
   b. Skin
      i. Epidermis
      ii. Dermis
      iii. Hypodermis
c. Accessory structures

5. Skeletal system
   a. Functions
   b. Histology
      i. Composition of osseous tissue
         1. Cell types
      ii. Types of bony tissue
         1. Compact bone
         2. Spongy bone
      iii. Gross anatomy of bones
         1. Long bones
         2. Short bones
         3. Flat bones
         4. Irregular bones
   iv. Bone growth
   v. Fractures
   vi. Axial skeleton
      1. Skull
      2. Hyoid bone
      3. Vertebral column
      4. Ribs
   vii. Appendicular skeleton
      1. Pectoral girdle
      2. Upper extremity
      3. Pelvic girdle
      4. Lower extremity

6. Articulations
a. Synovial
   i. Structure
   ii. Types
      1. Ball and socket
      2. Condyloid
      3. Hinge
      4. Pivot
      5. Saddle
      6. Gliding

7. Muscular system
   a. Characteristics
   b. Functions
   c. Types
   d. Anatomy of skeletal muscle
      i. Connective tissue
      ii. Histology
         1. Cell structure
         2. Myofilaments
         3. Sarcomere
      iii. Physiology of muscle contractions
         1. Sliding filament theory
         2. Structure and function of neuromuscular junction (NMJ)
         3. Energy for muscle contraction
         4. Agonist, antagonist, synergist

8. Nervous system
   a. Organization
      i. Central nervous system (CNS)
      ii. Peripheral nervous system (PNS)
   b. Histology
      i. Neuroglia
      ii. Neurons
         1. Structure
            a. Axons
            b. Dendrites
            c. Cell body
         2. Classification
            a. Structure
            b. Function
         3. Physiology
            a. Nerve impulse
               i. Resting potential
               ii. Action potential
               iii. Repolarization
               iv. Salutatory transmission
               v. Speed of transmission
            b. Conduction across a synapse
               i. Role of neurotransmitter
   4. Brain
      a. Brain stem
         i. Medulla oblongata
         ii. Pons
         iii. Midbrain
      b. Diencephalon
         i. Thalamus
         ii. Hypothalamus
      c. Cerebrum (telencephalon)
         i. Cortex
         ii. Hemispheres
         iii. White matter
         iv. Limbic system
d. Cerebellum  
e. Neurotransmitters  
f. Cranial nerves

9. Senses
  a. Vision
     i. Anatomy of the eye
        1. Accessory structures
        2. Fibrous tunic
        3. Vascular tunic
        4. Nervous tunic
        5. Lens
        6. Cavities and chambers  
     ii. Physiology of vision
        1. Refraction
        2. Stimulation of the photoreceptors  
           a. Rods
           b. Cones
  b. Hearing and equilibrium
     i. Anatomy of the ear
        1. External ear
        2. Middle ear
        3. Inner ear
     ii. Physiology of hearing
        1. Stimulation of the receptors
        2. Pitch versus frequency
        3. Hearing disorders
     iii. Physiology of equilibrium

10. Endocrine system
    a. General features
       i. Functions
       ii. Definitions
       iii. Endocrine versus nervous system
       iv. Regulation of hormonal secretion
       v. Hormone transport and metabolism
       vi. Types of hormones

11. Cardiovascular system
    a. Blood
       i. Functions
       ii. Composition
       iii. Formed elements
          1. Red blood cells (RBC, erythrocytes)
             a. Structure
             b. Hemoglobin
             c. Life span
             d. Numbers
             e. Disorders
          2. White blood cells (WBC, leukocytes)
             a. General characteristics
             b. Granular leukocytes
                i. Neutrophils
                ii. Eosinophils
                iii. Basophils
             c. Agranular leukocytes
                i. Lymphocytes
                ii. Monocytes
             d. Disorders
          3. Platelets (thrombocytes)
             a. Structure
             b. Function
             c. Disorders
4. Plasma
   a. Water
   b. Solutes
5. Blood types
   a. A,B,O groups
   b. Rh factor
   c. Compatible/incompatible transfusions
   d. Maternal/fetal incompatibility
b. Heart
   i. Function
   ii. Location
   iii. Structures
       1. Chambers
       2. Walls
       3. Valves
       4. Blood circulation pathway
   iv. Physiology
       1. Conduction system
       2. Electrocardiogram (ECG)
       3. Cardiac Cycle
          a. Atrial diastole
          b. Atrial systole
          c. Ventricular systole
          d. Ventricular diastole
          e. Timing
c. Blood vessels
   i. Arteries
      1. Structure
      2. Function
   ii. Capillaries
      1. Structure
      2. Function
   iii. Veins
      1. Structure
      2. Function
      3. Compared to arteries
   iv. Circulatory routes
      1. Systemic circulation
      2. Pulmonary circulation
12. Lymphatic system
   a. Functions
   b. Structures
      i. Lymph
      ii. Vessels
      1. Lacteals
   iii. Lymphatic organs and tissues
      1. Primary lymphatic organs
         a. Red bone marrow
         b. Thymus
      2. Secondary lymphatic organs and tissues
         a. Lymph nodes
         b. Spleen
   iv. Innate immunity
      1. Physical barriers
         a. Skin
         b. Tears
         c. Saliva
         d. Urine
         e. Mucous membranes
         f. Resident bacteria
2. Chemical barriers
   a. Oil secretions
   b. Lysozyme in saliva, tears, sweat
   c. Acidity of stomach and vagina
3. Phagocytic white blood cells
   a. Neutrophils
   b. Macrophages
4. Inflammatory response

v. Adaptive immunity
1. B cells
   a. Function
   b. Plasma cells
   c. Memory cells
2. T cells
   a. Function
   b. Cytotoxic cells
   c. Helper cells
   d. Memory cells
3. Apoptosis
4. Antibodies
   a. Structure
   b. Function

vi. Immunity
1. Active
   a. Natural infection
   b. Vaccine
2. Passive
   a. Antibodies
   b. Mother to fetus

vii. Disorders of immune system
1. Allergies
2. Tissue rejection
3. Autoimmune diseases
4. Immunodeficiency diseases

13. Respiratory system
   a. Respiratory organs
      i. Nose
      ii. Pharynx
      iii. Larynx
      iv. Trachea
      v. Bronchi
      vi. Lungs
   b. Physiology of respiration
      i. Breathing
         1. Inspiration
         2. Expiration
         3. Airway resistance
      ii. Air volumes and capacities
         1. Air volumes
         2. Lung capacities
      iii. Gas laws
      iv. External respiration
      v. Internal respiration
      vi. Transport of respiratory gases
         1. Oxygen
         2. Carbon dioxide (CO₂)

14. Urinary system
a. Kidney
   i. Gross anatomy
      1. Cortex
      2. Medulla
      3. Pelvis
   ii. Nephron
      1. Structure
      2. Types
      3. Blood flow
   iii. Physiology of the nephron
      1. Filtration
      2. Reabsorption
      3. Secretion
      4. Regulation of urine concentration
   iv. Ureters
      1. Anatomy
      2. Physiology
   v. Urinary bladder
   vi. Urethra
   vii. Urine
      1. Normal properties
      2. Urinalysis: tests for urinary function
   viii. Fluids, electrolytes, acids and bases
      1. Fluids and electrolytes
         a. Fluid balance
         b. Electrolytes
         c. Movement of body fluids
         d. Imbalances
      2. Acid/base balance
         a. Buffers
         b. Respiratory regulation of pH
         c. Urinary control of pH
         d. Acid/base imbalances

15. Digestive system
   a. Digestion types
      i. Mechanical digestion
      ii. Chemical digestion
      iii. Digestive end products
   b. Digestive processes
   c. Organization
      i. Gastrointestinal (GI) tract
      ii. Accessory organs
   d. Histology
      i. Tuncia mucosa
      ii. Submucosa
      iii. Muscularis
      iv. Serosa
   e. Sphincters
   f. Mouth
      i. Anatomy
      ii. Salivary glands
         1. Functions of saliva
      iii. Teeth
         1. Anatomy
      iv. Digestion in the mouth
         1. Mechanical
         2. Chemical
   g. Esophagus
      i. Anatomy
      ii. Physiology
h. Stomach
   i. Anatomy
   ii. Histology
      1. Rugae
      2. Gastric pits
      3. Muscularis
   iii. Digestion
      1. Mechanical
      2. Chemical

i. Pancreas
   i. Anatomy
   ii. Histology
      1. Pancreatic islets (islets of Langerhans)
      2. Acini cells

j. Liver
   i. Anatomy
   ii. Histology
   iii. Bile
      1. Composition
      2. Function

k. Small intestine
   i. Anatomy
   ii. Histology
   iii. Intestinal juice
      1. Composition
      2. Control of secretions
   iv. Digestion
      1. Mechanical
      2. Chemical
   v. Absorption
      1. Carbohydrates and amino acids
      2. Lipids (lacteals)
      3. Water and electrolytes
      4. Vitamins

l. Large intestine
   i. Anatomy
   ii. Histology
   iii. Physiology
      1. Movement
      2. Chemical digestion – none
      3. Bacterial action
      4. Absorption
      5. Defecation

16. Male reproductive system
   a. Chromosomal basis of sex
   b. Embryonic differentiation of male and female reproductive systems
   c. Male reproductive organs
      i. Testes
         1. Structure
         2. Functions
            a. Hormone secretions
            b. Spermatogenesis
      ii. Epididymis
      iii. Vas deferens
      iv. Prostate gland
      v. Seminal vesicles
      vi. Ejaculatory duct
      vii. Bulbourethral gland
viii. Urethra
ix. Penis
  1. Structure
  2. Physiology
     a. Erection
     b. Ejaculation
x. Semen
  1. Contributing organs
  2. Composition
d. Male hormones
  i. Follicle stimulating hormone (FSH)
  ii. Luteinizing hormone (LH)
  iii. Testosterone

17. Female reproductive system
a. Female reproductive organs
  i. Ovaries
     1. Structure and location
     2. Follicle development
     3. Ovulation – mechanism
     4. Hormone secretion – estrogen and progesterone
  ii. Fallopian tubes
  iii. Uterus
     1. Structure and location
     2. Cyclic changes in the endometrium
iv. Vagina
v. External genitalia (vulva)
vi. Mammary glands
vii. Menstrual cycle
viii. Ovarian cycle
ix. Uterine cycle
x. Endocrine control and feedback cycles
xi. Menstrual irregularities
xii. Menarche
b. Menopause

c. Female hormones
  i. FSH
  ii. LH
  iii. Estrogen
  iv. Progesterone
  v. Inhibin
  vi. Oxytocin
d. Birth control
  i. Surgical methods
  ii. Chemical methods
  iii. Barrier methods
  iv. Completion of meiosis II by female gametes
  v. Union of male and female nuclei

Resources


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**Instructional Services**

**OAN Number:**

TMNS

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**Key:** 902