

**Bio Medical Core
Health Sciences 1110
Course Objectives**

Module 1- Introduction to Body Organizational Metrics

The purpose of this introductory module of biomedical sciences core class is to acquaint the student with basic terminology, with relationships of human anatomy and with the units of measurement used in the metric system. It is a basic module because all of these terms, relationships and units will be the keys to understanding the content of the remainder of the course.

Objective 1

Define anatomy and its specific branches and contrast it with physiology.

Objective2

Identify the relationship between structure and function in living things.

Objective3

Define, cell, tissue, organ, and system.

Objective4

Arrange, in order, the six levels of structural organization.

Objective5

Identify functions of the eleven organ systems of the body.

Objective6

Describe the human anatomical position

Objective7

Identify the following anatomical terms:

Cranial, Orbital, Buccal, Cervical, Thoracic, Axillary; Cubital, Inguinal, Femoral, Carpal, Metacarpal, Patellar, Gluteal, Plantar, Tarsal.

Objective8

Define the directional terms used in human anatomy.

Objective9

Identify the planes commonly used to divide the body into portions.

Objective10

Locate the following body cavities:

Dorsal, cranial, vertebra, ventral, thoracic, mediastinal, pericardial, pleural Abdominal, pelvic

Objective11

Locate the following organs:

Superior vena cave; omentum (greater); liver; stomach; lungs; small intestine; diaphragm; heart; thyroid gland; esophagus; aorta; kidneys; ureters; urinary bladder, inferior vena cava; trachea; large intestine

Objective12

Identify the most specific body cavity in which the following organs are located: heart; lungs; bronchi; intestines; kidneys; spinal cord; stomach; brain; urinary bladder; sex organs

Objective13

Distinguish the nine abdominopelvic regions from the four abdominoplevic quadrants.

Objective14

Identify the abdominopelvic quadrant in which each of the following organs is located: liver spleen; left kidney; cecum; appendix; left ovary.

Objective15

Locate the following bones:

Skull; sternum; clavicle; pelvic girdle; ulna radius; humerus; femur; patella; tibia; fibula; vertebral column

Objective16

Define homeostasis; stress; and identify the relationship between them.

Objective17

Define negative and positive feedback and describe the negative feedback systems that are responsible for maintaining nervous system homeostasis of blood pressure and endocrine system

Objective18

Apply knowledge of the metric system to solve problems such as those in the “Basic Metrics” Supplement of the study notes.

Module 2- Inorganic Chemistry

Objective1

Define the following terms:

Weight; mass; density; matter; state of matter; element; atom

Objective2

Given the atomic symbol of any element; identify the name of the element.

Objective3

Define the major function(s) performed in living organisms by the following elements: calcium; phosphorus; chlorine; sulfur; potassium; sodium; magnesium; iodine; iron; oxygen; carbon

Objective4

Define the following: Proton; neutron; electron; atomic number; atomic weight; mass number; isotopes

Objective5

Given a representative section from the periodic chart determine for the average atom of any element the atomic weight and mass number; the number of electrons in a neutral atom; the number of protons and number in the nucleus

Objective6

Given a representative section from the periodic chart, predict the number of electrons in the outer shell and whether the atom prefers to give away, accept, or share electrons when undergoing a chemical reaction

Objective7

Define the following terms:

Ion, cation, anion

Objective8

Considering the number of electrons given or accepted during a chemical reaction, predict the charge on the resulting ion(s).

Objective9

Describe the characteristics of ionic, covalent, and hydrogen bonds.

Objective10

Define the following terms:

Compound; molecule; molecular; H₂O;CO₂

Objective11

Given the chemical formula of a compound identify the constituent atoms and the number of each in one molecule of the compound

Objective12

Given a compound containing any atoms, name the compound.

Objective13

Given the formula for a polyatomic ion, name it.

Objective14

Distinguish the relative size of the particles present in solutions, colloids, and suspensions.

Objective15

Distinguish the properties of solutions and suspensions.

Objective16

Identify one important difference between crystalloid and colloids.

Objective17

Define dilute solution,, concentrated solution and specify the procedure for preparing a percent solution.

Objective18

Given the ions formed when a compound is placed in water, classify it as an acid or base or salt.

Objective19

Define pH

Objective20

Given the pH of a solution, categorize it as acidic, basic, or neutral

Objective21

Given the pH of two solutions compare their relative hydrogen ion concentrations.

Objective22

Distinguish between “neutral” pH and the “average” pH range of blood.

Objective23

Define weak acid, strong acid, and contrast their effects on disruption of human physiology.

Objective24

Explain the function of buffer systems.

Objective25

Distinguish inorganic from organic compounds

Objective26

Given a chemical reaction, classify it a synthesis, decomposition, exchange, or reversible.

Objective27

Identify the four most abundant elements in living systems.

Objective28

Distinguish inorganic from organic compounds.

Objective29

Given any of the properties of water, provide an example of how this property is utilized in the human body.

Module 3- Organic Chemistry

Objective1

Define protoplasm

Objective2

Name the major kinds of inorganic and organic substances found in living protoplasm

Objective3

Name the basic building blocks of carbohydrates, proteins and lipids.

Objective4

Given any one of the following formulas for a simple compound, determine the others: The electron dot formula, the structural formula, the molecular formula; the abbreviated structure formula.

Objective5

Identify the formulas of the four smallest hydrocarbons.

Objective6

Explain why it is possible to have such a wide variety of carbon compounds.

Objective7

Recognize the general structure of the basic building block of carbohydrates.

Objective8

Classify representative carbohydrates as mono, di- or polysaccharides

Objective9

Explain the overall of function of carbohydrates

Objective10

Describe the major physiological role of the following carbohydrates:

Glucose; ribose; deoxyribose; glycogen; sucrose

Objective11

Recognize the general structure of the basic building blocks of protein.

Objective12

Distinguish dipeptides; tripeptides; polypeptides and proteins.

Objective13

Describe primary, secondary, tertiary, and quaternary structure of proteins.

Objective14

Define denaturation

Objective15

Describe the major physiological role of the six classes of proteins and give an example of each.

Objective16

Explain the function of enzymes.

Objective17

Describe the nomenclature of enzymes.

Objective18

Recognize the general structure of the basic building block of fat (triglycerides)

Objective19

Distinguish saturated fats, monounsaturated fats and polyunsaturated fats.

Objective20

Describe the major physiological role of the following lipids:
Fats; phospholipids; steroids and prostaglandins.

Objective21

Contrast the general meaning of hydrolysis and dehydration synthesis.

Objective22

Compare hydrolysis and dehydration synthesis in carbohydrates; proteins and fats.

Objective23

Compare the energy yield of carbohydrates, proteins and fats.

Objective24

Describe the $ATP \leftrightarrow ADP + P + ENERGY$ conversion which occurs when the body needs energy and when the body stores energy.

Objective25

Describe the method for detecting the presence of energy.

Objective26

Given the force required to move an object and the distance it moves, calculate the amount of work done.

Objective27

State the first and second laws of thermodynamics and discuss the implications.

Objective28

Distinguish kinetic energy verse potential energy.

Objective29

Contrast the way that kinetic energy and momentum are related to the velocity of an object.

Objective30

Distinguish heat versus temperature and note how they are measured.

Objective31

Identify the freezing point of water, the boiling point of water and “average body temperature” of the Fahrenheit and Celsius scales.

Objective32

Explain the implications of the fact that water has high specific heat.

Objective33

Correlate the heat transfer involved during a “change of the state” of water.

Objective34

Explain why a steam burn is likely to be more severe than a boiling water burn, even if they are both at the same temperate.

Objective35

Identify the relationship between atmospheric pressure and the temperature at which water boils and suggest a practical consequence of this fact.

Objective36

Describe the internal sources of heat in a normal person.

Objective37

Identify and rank the four major processes by which heat is lost from the human body. Calculate a specific example for evaporation.

Objective38

Discuss the limitation of the concept of “normal body temperature.”

Objective39

Describe the mechanisms by which the body controls its temperature.

Module 4- The Cell

The first three units laid the groundwork necessary to study the cell, which is the unit of structure in all living things. During the study of the cell, you will note the close relationship between structure and function. The remarkable organization of organic and inorganic materials to produce living protoplasm will be evident. You will also begin to see that chemistry and physics are very much a part of the living system.

Cell physiology depends to a great extent upon the ability of the cell membrane to control substances which enter and leave the cell. Some of the processes involved are physical processes which involve random physical movement of molecules. Other processes require expenditure of energy by the cell. The necessary physical and biochemical backgrounds will be provided so that these processes within cell membranes will have meaning for the biomedical student.

The study of the cell is a fascinating voyage into one of the most intricate and delicate structures in the entire known universe. It is also the gateway to understanding every organ system to follow. You will find that a thorough knowledge of the principles presented here will give you the key to unlock the treasure house of the human body.

Objective1

Describe the four principle parts of a generalized animal cell.

Objective2

Define (selective permeability) semipermeable membrane

Objective3

Describe the cell membrane in terms of its structure and major functions.

Objective4

Select the factors the enable molecules to penetrate a cell membrane most easily.

Objective5

Identify the factors which determine whether a transport process will be classified as active of passive.

Objective6

Define each of the following transport processes and classify them as active of passive.

Objective7

Given the concentrations on the two sides of the membrane of a substance to which the membrane is permeable, determine the direction in which net diffusion will occur when the substance moves down a concentration gradient.

Objective8

Describe the fate of a red blood cell if placed in either a hypotonic or a hypertonic solution.

Objective9

Given two solutions separated by semi-permeable membrane, predict the direction in which the molecules of water will move by the process of osmosis.

Objective10

Describe the purpose of the microvilli found on the membranes of certain cells.

Objective11

Identify the location, composition, and function of cytoplasm.

Objective12

Select the major function of the cell nucleus.

Objective13

Describe the following structures within the cell nucleus:

Nucleoli; gene; chromatin; chromosome

Objective14

Describe the major function of the following organelles:

Ribosomes; endoplasmic reticulum; golgi complex; mitochondria; lysosomes; peroxisomes; microfilaments; microtubules; centrioles; centrosome; flagella; cilia

Objective15

Define “cell inclusion” and identify one example.

Objective16

Identify the functions of extracellular (interstitial) material.

Objective17

Identify one example of an amorphous matrix material and one example of a fibrous matrix material.

Objective18

Describe cell division and the overall processes involved.

Objective19

Define the process of mitosis and identify two general purposes served by mitosis.

Objective20

Identify a major characteristic of each of the four stages of mitosis.

Objective21

Describe the process of DNA duplication (replication) which occurs during interphase. Also define nucleotide, codon and mutation.

Objective22

Given any one of the four nitrogen bases of DNA, identify its complementary nucleotide.

Objective23

Distinguish transcription and translation and identify the role played by each of the following during the manufacture of a specific kind of protein:

DNA; m-RNA; t-RNA; r-RNA

Objective24

Identify the location in the cell where synthesis of the following molecules occurs:

Lipids; carbohydrates; nucleic acids

Module 5- Microbiology

Microbiology is the study of living things which are so small that a microscope is required to see them. We are surrounded by microorganisms (microbes). Some of these are very important and beneficial to us. Others are harmful and cause disease, spoilage, etc.

Objective1

Compare the principal differences between eukaryotic and prokaryotic cells and list the groups of organisms that are included within each category.

Objective2

Identify the characterized the three obligate microbial parasites.

Objective3

Identify free living microorganisms.

Objective4

Describe shapes and groupings of bacteria.

Objective5

Characterize bacterial cell wall composition and relate it to staining; compare characteristics of gram-positive (gram+) and gram-negative (gram-) bacteria.

Objective6

Describe bacterial sporulation and germination and identify the involved groups.

Objective7

Describe the nutritional patterns among organisms.

Objective8

Describe bacterial growth; compare the phases of growth.

Objective9

Describe viral replication and its consequences to the host cell; cite examples of viral diseases.

Objective10

Characterize the three types of symbiotic relationships between microorganisms and their hosts.

Objective11

Define normal flora; identify areas of the human host that consistently harbor normal flora and their major inhabitants.

Objective12

Contrast the four routes for disease transmission.

Objective13

Differentiate among the portals of entry for pathogenic microbes.

Objective14

Describe the pathogenic mechanisms of bacteria and related to endotoxins and exotoxins.

Objective15

Describe the cytopathetic effects of viruses and mechanisms of host injury used by other microbes.

Objective16

Describe nonspecific protective mechanisms that guard against the establishment of infectious diseases in a human host.

Objective17

Describe specific protective mechanisms that guard against the establishment of infectious diseases in a human host.

Objective18

Define nosocomial infections; identify causes of these infections and state their importance.

Objective19

Characterize the features and patterns of primary acute, and secondary acute, chronic, latent, and subclinical infections; identify systemic host alterations.

Objective20

Identify the major steps to determine the specific bacteria causing an infection in an individual patient.

Objective21

Other than causing disease in humans, cite ways in which microbes are beneficial or harmful to humans.

Objective22

Describe the prevention and control of cross infection and autogenous infection.

Objective23

Define the terms that indicate destruction and/or suppression of microbes.

Objective24

Identify the mode of action for physical and chemical methods of microbial control.

Objective25

Estimate the time of survival for microbes at ambient temperatures.

Objective26

Identify the range and spectrum of antibiotic activity; describe the mode of action for antibiotics.

Objective27

Identify the three general methods by which bacteria acquire drug resistance to antibiotics and cite examples.

Objective28

Explain the preparation of vaccines to prevent disease and identify hepatitis B vaccines available to health care professionals; speculate on an AIDS vaccine.

Module 6- Tissues

The skin or cutaneous membrane, with its related structures, forms the integumentary system. We will study this system and its role in body defense and temperature regulation.

Objective1

Define tissue and histology

Objective2

Identify the major function of each of the principle types of tissue:

Epithelial; connective; muscular; nervous; reproductive

Objective3

Identify the general characteristics of epithelial tissue.

Objective4

Distinguish epithelial cell shapes, layering, location, and function.

Objective5

Define endothelium

Objective6

Identify the type of epithelium found in the following places: Air sacs of lungs (alveoli); kidney tubules; intestines and stomach, upper respiratory tract; lining of the mouth; outer skin; lining of the urinary bladder

Objective7

Identify the function of the following structures as well as the kind of epithelium in which all three structures can be found:

Microvilli; goblet cells; cilia

Objective8

Contrast the basic function of glandular epithelium with functions of lining and covering epithelium.

Objective9

Contrast exocrine and endocrine glands

Objective10

Contrast the general characteristics and function of epithelial tissue vs. connective tissue.

Objective11

Identify the basic types of adult connective tissue.

Objective12

Contrast the structural characteristics of areolar connective tissue versus that of cartilage.

Objective13

Describe the structural and functional characteristics of each of the three types of fibers produced by fibroblasts.

Objective14

Describe the functions of the following structures found in loose (areolar) connective tissue: hyaluronic acid; macrophages; plasma cells; mast cells; fibroblasts.

Objective15

Define the following structures found in cartilage (the third major type of connective tissue).

Objective16

Contrast epithelial membrane and synovial membrane. Describe the general body location of each of the principle types of membranes.

Objective17-18

Distinguish between the parietal and the visceral portions of serous membranes.

Objective19

Select the correct body cavity location of the pleura, the pericardium and the peritoneum.

Module 7- Nervous System Part 1

In every system we study, we refer to the influence of the nervous system. The nervous system is the great communications medium and with the endocrine system, serves to integrate and coordinate all of the systems into one unified whole.

The nervous system has some similarity to an electrical conduction system. Therefore, in this module, we will take a look at some of the physical principles of electricity, and some applications of electricity to medicine.

Objective1

Select three broad functions of the nervous system

Objective2

Label an organizational chart of the nervous system

Objective3

Compare the function of neuroglia and neurons.

Objective4

Identify the functions performed in a neuron by each of the structures below.

Objective5

Match the structural features of a neuron with the proper classification: multipolar, bipolar, or unipolar and describe structural variations of neurons.

Objective6

Identify the functions of afferent (sensory), efferent (motor), and internuncial (association) neurons.

Objective7

Describe the conditions under which nerve tissue can regenerate.

Objective8

Cite the mechanism which establishes and maintains the resting potential of the neuron membrane.

Objective9

Given a list of events which occur when a nerve impulse is initiated and transmitted, select the correct sequence of events.

Objective10

Define the “all-or-none” principle of nerve impulse transmission and define salutatory transmission.

Objective11

Describe the relative velocity of nerve impulse conduction over A, B, and C fibers and identify the anatomical reason for the difference.

Objective12

Define the following terms:

Synapse; synaptic cleft; pre-synaptic neuron; post-synaptic neuron; synaptic vesicle; excitatory transmitter (neurotransmitter) substance; inhibitory transmitter (neurotransmitter) substance.

Objective13

Select the reason why impulse conduction across synapses is always one way.

Objective14

Identify the roles of acetylcholine (Ach) and of acetylcholinesterase (AchE) in synaptic transmission.

Objective15

Define synaptic fatigue and integration.

Objective16

Select a definition and an example of the following neuronal circuits.

Objective17

Define the following:

Static electricity; dynamic electricity; electrical charge; polarity; conductor; insulator

Objective18

Cite the rationale behind preventing the build-up of static electricity in the operating room.

Objective19

Select a statement which identifies under what condition water will conduct an electrical current.

Objective20

Define the following:

Ampere; ohm; volt

Objective21

Identify the factor which is most directly related to the degree of damage done when a person sustains electrical shock.

Objective22

Identify the usual cause of death in electrocution.

Objective23

Identify diagnostic measurements based upon body surface potential.

Objective24

Cite the clinical usefulness of the following treatments: Electrostimulation; electric shock therapy; electrical pacemakers; diathermy; defibrillation

Objective25

Identify structures comprising white matter and gray matter of nervous tissue.

Objective26

Define the following:

Nerve; tract; ganglion; nucleus

Objective27

Describe the following general features of the spinal cord:

The level to which it extends; its gray and white matter; its overall function

Objective28

Identify the structures responsible for the maintenance and protection of the central nervous system.

Objective29

Identify the purpose and site of a lumbar puncture.

Objective30

Identify the structures contained in the following regions in or near the spinal cord: dorsal root; ventral root; columns (white columns); anterior gray horn; posterior gray horn.

Objective31

Given the name of a tract of the spinal cord, predict its origin; its termination; and whether it is sensory or motor.

Objective32

Identify the role of each of the components of a reflex arc.

Objective33

Describe the components and pathways involved in a simple stretch reflex, such as the patellar (knee jerk) reflex.

Objective34

Describe the diagnostic implications of the following reflexes:

Patellar reflex; Achilles reflex; Babinski reflex

Objective35

List the distribution of the 31 pairs of spinal nerves.

Objective36

Define the term plexus

Objective37

Select the plexus from which arises the phrenic nerve and the sciatic nerve.

Objective38

Select the outcome if transection of the spinal cord occurs in the following locations:

Base of skull; at the sixth spinal nerve; between enlargements.

Module 8- nervous system part 2

Objective1

Identify the four principle parts of the brain

Objective2

Describe the source and composition of cerebrospinal fluid, the area through which it circulates, and the results of an obstruction of CSF

Objective3

Characterize the features of the blood supply to the brain and define the “blood-brain barrier”

Objective4

Recognize the relative locations and general functions of three divisions of the brain stem

Objective5

Describe the meaning and importance of decussation of motor fibers.

Objective6

Recognize the general function of the two divisions of the diencephalons (thalamus and hypothalamus).

Objective7

Select a description or a definition of each of the terms below as applied to the cerebrum:

Cerebral cortex, convolution; fissure; sulcus; longitudinal fissure; cerebral hemisphere; corpus callosum.

Objective8

Identify the general function of each lobe of the cerebrum

Objective9

Compare the function of association, commissural and projection tracts.

Objective10)

Describe the general location of the cerebral nuclei (basal ganglia)

Objective11

Identify the general location and overall function of the limbic system.

Objective12

Identify the specific source of waves recorded on an electroencephalogram.

Objective13

Recognize the implications of the split-brain concept (brain lateralization)

Objective14

Describe the similarities in structural features of the cerebrum and cerebellum.

Objective15

Cite the major functions of the cerebellum.

Objective16

Contrast the general function characteristics of the following:

Acetylcholine; norepinephrine; dopamine; serotonin; glutamic acid; aspartic acid; GABA; glycine; enkephalins; endorphins; dynorphin.

Objective17

List the general name, number and general function of the 12 pairs of cranial nerves.

Objective18

Outline the basic components of and the functional differences between the autonomic (visceral efferent) nervous system and the somatic (efferent) nervous system.

Objective19

List the two divisions of the autonomic nervous system, their place of origin and their general functions.

Objective20

Distinguish the location and function of autonomic preganglionic and postganglionic neurons.

Objective21

Describe or define “autonomic ganglia”

Objective22

Compare the sympathetic and parasympathetic divisions of the autonomic nervous system in terms of chemical transmitters released and the extent of visceral effectors response elicited.

Objective23

Classify the effect of sympathetic nerve stimulation on the organs listed below:

Heart; breathing; liver; intestines/stomach; adrenals

Objective24

Define the following:

Dual innervation; rest/repose; flight/fight; visceral autonomic reflex arc

Objective25

Discuss the therapeutic value of biofeedback and transcendental mediation.

Objective26

Identify either by cause of symptoms each of the following conditions:

Poliomyelitis (polio); tabes dorsalis; cerebral palsy; parkinsonism; multiple sclerosis; epilepsy; cerebrovascular accidents (CVA or “stroke”); dyslexia

Objective27

Identify the meaning of the medical terms listed below:

Analgesia; aphasia; coma; neuralgia; neuritis; encephalitis

Objective28

Select the probable way in which anesthesia produces loss of sensation.

Objective29

Identify three ways in which microbes can enter the central nervous system.

Objective30

Cite the common cause of acute inflammation of the meninges (meningitis).

Objective31

For each of the listed diseases, identify the type of muscle paralysis and the underlying cause of the paralysis.

Module 9- Sensations

In this unit of study, we will study general sensations and our special senses. We will learn about the mechanisms that allow us to be aware of both our internal and our external environments. Often we take our senses for granted, and do not appreciate the marvelous masterpieces of structure and function which they are. After we have studied the sense organs, we will briefly review the principles of physics which apply to the transmission of sound energy and light energy.

Objective1

Define sensation and the events/components required to produce a summation and the site where sensations occur.

Objective2

Define the following processes and characteristics of perceived sensations:

Projection; adaptation; after-image; modality

Objective3

Describe the location and function of the following:

Exteroceptors; visceroreceptors; proprioceptors

Objective4

Given the results of a two-point discrimination test, select the most sensitive area (i.e. the one with the greatest supply of touch receptors).

Objective5

Identify the location of the receptors for the following general sensations:

Touch; pressure; heat/cold; pain; proprioception

Objective6

Differentiate visceral pain; somatic pain; referred pain; and phantom pain

Objective7

Identify how referred pain is used to help in the diagnosis of myocardial infarction.

Objective8

Identify the rationale for and the type of surgery performed to relieve pain which does not respond to pain-killing drugs

Objective9

Describe two theories of how acupuncture works.

Objective10

Identify the location of the receptors, and trace the nerve pathway to the brain for two of the special senses, olfactory and taste.

Objective11

Identify a function performed in common by the eyebrows; eyelashes, eyelids and lacrimal apparatus.

Objective12

Select the sequence of structures through which tears pass from the lacrimal gland to the nasal cavity.

Objective13

Given a diagram, identify the principle anatomical structures of each of the three tunics of the eye.

Objective14

Describe the interior structure of the eyeball.

Objective15

Describe the glaucoma in terms in intraocular pressure, aqueous humor and the canal of schlemm.

Objective16

Name the four basic processes required to focus light rays (to form an image on the retina).

Objective17

Define refraction and list the four refractive media of the eye and the order in which light passes through them.

Objective18

Define accommodation and select the correct definition for the following:

Accommodation, myopia; hypermetropia; emmetropia; astigmatism

Objective19

Describe constriction of the pupil and its purposes.

Objective20

Define convergence as a mechanism by which light rays strike both retinae and corresponding points.

Objective21

Compare the location and general functions of the intrinsic and extrinsic eye muscles as they relate to accommodation and convergence.

Objective22

Describe why the retinal image is “inverted” and where the image is turned upright.

Objective23

Identify and distinguish the structures of the retinal which play a direct role in converting light energy into nerve impulses.

Objective24

Describe the relationship between the rhodopsin cycle and the ability to adjust for vision under dim lighting.

Objective25

Trace the afferent pathway of light impulses to the brain and note the function of the optic chiasma.

Objective26

Given a diagram of the ear, label all the parts of the outer, middle and inner ear.

Objective27

Describe the function of the auditory (Eustachian) tube.

Objective28

Trace the passage of sound waves from the air to the hair cells of the cochlea and name the anatomical part transmitting the vibration.

Objective29

Trace the neural pathway of impulses for sound and site where actual hearing occurs.

Objective30

Identify the structures of the inner ear where the receptor for static equilibrium and dynamic equilibrium are located.

Objective31

Given the symptoms and/or causes of any of the following, identify the disorder.

Cataract; conjunctivitis; Meniere's disease

Objective32

Define the medical terminology associated with the sense organs.

Objective33

Differentiate between transverse and longitudinal waves and identify the class to which sound waves and light waves belong.

Objective34

Define the following terms associated with waves:

Displacement; amplitude; wavelength; frequency; velocity; reflection; refraction; absorption; transmission; diffraction

Objective35

Distinguish between constructive and destructive interference.

Objective36

Identify the average velocity of sound waves in air at 20°C and compare this with the velocity of sound in liquids and solids.

Objective37

Identify the physical factor which produces the pitch of voice and the loudness of sound.

Objective38

Identify the wavelength range of the spectrum to which the human eye can respond.

Objective39

Describe, in terms of reflection and/or absorbance, why an object appears to have a given color.

Objective40

Describe why the sky appears blue and why the sunset colors are orange and red.

Module 10- Endocrine System

The endocrine system shares with the nervous system the function of controlling and integrating all other systems into one well-coordinated organism. Whereas the organs of all other systems have some physical proximity or physical continuity with each other, the organs which make up the endocrine system are widely scattered. In spite of this, they have mediated influence, not only on each other, but also on the other organs of the body. This influence is mediated through their specific hormone products. The role of the endocrine glands in controlling homeostasis and in meeting stress situations will conclude the study of this module.

Objective1

List the four broad areas of hormonal action

Objective2

Distinguish between endocrine and exocrine glands.

Objective3

Identify the relationship between an endocrine gland and a target organ or cells.

Objective4

Describe the two proposed mechanisms of hormonal action.

Objective5

Characterize prostaglandins and list some of their major functions.

Objective6

Distinguish negative versus positive feedback and explain the relative importance of these two mechanisms in regulating hormone levels in the blood.

Objective7

Describe the anatomical and physiological relationships between the pituitary (which includes the adenohypophysis and the neurohypophysis) and the hypothalamus.

Objective9

Identify the source of the hormones secreted by the neurohypophysis, their target organs; and functions.

Objective10

Describe pituitary dwarfism, Simmond's disease, gigantism acromegaly and diabetes insipidus.

Objective11

Explain how thyroxine is synthesized, stored and transported.

Objective12

Identify the physiological effects and regulation of secretion of (thyro) calcitonin.

Objective13

Describe the negative feedback mechanism that regulates TSH and thyroxine hormones secretion. Identify stimulus, response, tropic and non-tropic hormones and target organs.

Objective14

Cite the clinical symptoms of the abnormalities of thyroid secretion.

Objective15

Describe the physiological effects of parathyroid hormone, and how the secretion of parathyroid hormone is regulated.

Objective16

Contrast the cause and the symptoms of tetany with the causes and symptoms of osteitis fibrosa cystica.

Objective17

Identify the effects of adrenal cortical mineralocorticoids, glucocorticoids and gonadocorticoids.

Objective18

Describe the mechanism of control of the mineralocorticoid aldosterone by reninangiotensins.

Objective19

Compare the effects of hypo- and hypersecretions of adrenalocortical hormones.

Objective20

Compare the effects of adrenal medullary secretions to the effects of sympathetic.

Objective21 and22

Compare the roles of glucagons and insulin in the control of blood glucose levels. Identify the principle effects of hyperinsulinism and hypoinsulinism.

Objective23

List the major hormones secreted by ovaries and testes.

Objective24

Identify the physiological effects of the hormones secreted by the pineal gland.

Objective25

Define the role of the thymus gland.

Objective26

Define the general adaptation syndrome and compare homeostatic responses and stress responses.

Objective27

Identify the body reactions during the alarm, resistance, and exhaustion stages of the general adaptation syndrome.

Objective28

Define the medical terminology associated with the endocrine system.