UNIVERSITY OF ALBERTA
FACULTY OF NURSING

Keyano COLLEGE

NURSING 117

ANATOMY AND PHYSIOLOGY

SEPTEMBER 5th – DECEMBER 16th, 2014

This course is equivalent to N140 and N150 at the U of A

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Nurse 117
Anatomy and Physiology
Course Outline

Nurse 117 - Anatomy and Physiology I (6 credits, 15 weeks, 6 hours lecture)

Calendar Statement

This course is an introduction to the structure and function of the human body. This course must be completed prior to year 3 of the program.

Course Description

Nursing 117 is a 6 credit Anatomy and Physiology course offered to first year nursing students. This course will introduce students to Anatomy, which is the study of the structure and relationships among structures; and Physiology which is the science that describes the normal function of living organisms with respect to the activities of tissues, organs, and systems. The central focus of the course is to illustrate and integrate structural principles and to build a fundamental knowledge and correlation between structure and function and of general system rules.

Course Objectives

1. To demonstrate a basic understanding of the structure and normal functions of the human body
2. To be able to use the technical vocabulary and medical terminology related to anatomy in written and verbal communication
3. To be able to link between structures and normal body functions.
4. To be able to integrate the knowledge of anatomy and underlying concepts and principles of physiology to clinical situations.
5. To foster the development of critical thinking skills in relation to anatomy and physiology.

Required Textbooks

Martini, F.H., & Bartholomew, E. F. (2012). *Essentials of Anatomy and Physiology* (6th ed.). San Francisco: Pearson Education Inc.

Suggested Study Guide

Martini, F. H., Bartholomew, E. F., & Seiger C. (2012). *Study Guide: Essentials of Anatomy & Physiology*. 6th Revised Edition. San Francisco: Benjamin-Cummings Publishing Co.

Lectures

Learning for Nurse 117 will take place utilizing a lecture format. The lectures will be supported with power point presentations available through Moodle. A series of guiding questions that will assist in learning are provided in the syllabus.

Classes will be held twice per week:
Tuesday 1300 – 1600h and Friday 0900 - 1200h.
(Classes are noted on N114 timetable)

Classes will be held in room 195.

Specialized Supports and Duty to Accommodate

Disability Support Services: Learner Assistance Program
If you have a documented disability or you think that you would benefit from some assistance from a Disabilities Counsellor, please call or visit the Disability Supports Office 780-792-5608 to book an appointment (across from the library). Services and accommodations are intended to assist you in your program of study, while maintaining the academic standards of Keyano College. We can be of assistance to you in disclosing your disability to your instructor, providing accommodations, and supporting your overall success at Keyano College.

Specialized Supports and Duty to Accommodate
Specialized Support and Duty to Accommodate are aligned with the office of Disability Support Services: Learner Assistance Program (LAP) guided by federal and provincial human rights legislation and defined by a number of Keyano College policies. Keyano

College is obligated by legislation to provide disability-related accommodations to students with identified disabilities to the point of undue hardship.

Nursing Program Policies

Please refer to the Keyano College Nursing Program Student Handbook for specific Nursing program policies and to the Keyano College 2014/2015 Calendar for general college policies.

Absence

If you are ill and unable to write an in-class exam, you must let the instructor know prior to the exam so that other arrangements can be made. Please call the Administrative Assistant at 780 791-4889. If there is no answer, you must leave a message about the absence. Failure to call prior to the exam will result in a failure for that exam.

Evaluation Criteria

Exams may contain multiple choice, fill-in-the-blank, matching questions plus labelling of diagrams.

1.	**Chapter Quizzes**	**10%**
2.	**Exam #1**	**15%**
3.	**Exam #2**	**20%**
4.	**Exam #3**	**25%**
5.	**Final Exam**	**30%**
		100%

Exam Dates

	Date	Time	Chapters to be tested
Exam #1 15%	Friday **September 19th**	**0900-1200**	1, 2, 3, 4, 5
Exam #2 20%	Friday **October 10th**	**0900-1200**	6, 7,17
Exam #3 25%	Tuesday **November 4th**	**1300-1600**	11, 12, 13 & 15
Final Exam 30%	Tuesday **December 16th**	**0900-1200**	8,9,10,14,16,18.,19.& 20

Chapter Quizzes - 10% (total)

At the conclusion of each chapter, a quiz to assess student knowledge will be available on Moodle. Each quiz will be available until the closing date and time shown on the N117 schedule (see page 5). After 1800h on the date shown the quiz will no longer be available to access and a grade of zero will be assigned to any student who has not completed the quiz. All quiz marks will be combined for a final assigned alpha grade and count for 10% of the final course grade.

In order to successfully complete Nursing 117, students must successfully complete all exams as well as receive a passing grade (C-) in the course.

NURS 117 CLASS SCHEDULE

CLASS	DATE	TIME	SUBJECT	REQUIRED READING	CHAPTER QUIZ CLOSE DATE-1800h
1	September 5	0900-1200	Course Orientation		
2	September 5	0900-1200	Intro to A & P	Chapter 1	*Sept 6*
3	September 9	1300-1600	Intro to chemistry	Chapter 2	*Sept 10*
4	September 12	0900-1200	Cell structure and function& Tissue Levels	Chapter 3 & 4	*Sept 13*
5	September 16	1300-1600	Integumentary System	Chapter 5	*Sept 17*
6	**September 19**	**0900-1200**	**Exam #1-15%**	**C h 1-5**	
7	September 23	1300-1600	Skeletal System	Chapter 6	
8	September 26	0900-1200	Skeletal System	Chapter 6	*Sept 27*
9	September 30	1300-1600	Muscle System	Chapter 7	
10	October 3	0900-1200	Muscle system	Chapter 7	*Oct 4*
11	October 7	1300-1600	Nutrition and Metabolism	Chapter 17	*Oct 11*
12	**October 10**	**0900-1200**	**Exam #2 – 20%**	**Ch 6. 7. 17**	
13	October 14	1300-1600	CV System: Blood	Chapter 11	*Oct 15*
14	October 17	0900-1200	CV System: Heart	Chapter 12	
15	October 21	1300-	CV System: Heart	Chapter 12	*Oct 22*

		1600			
16	October 24	0900-1200	CV System: Blood vessels & Circulation	Chapter 13	
17	October 28	1300-1600	CV System: Blood vessels & Circulation	Chapter 13	*Oct 30*
18	October 31	0900-1200	Respiratory	Chapter 15	*Nov 1*
19	**November 4**	**1300-1600**	**Exam #3 – 25%**	**Ch 11 – 13, 15**	
20	November 7	0900-1200	Digestive	Chapter 16	*Nov 8*
21	November 11	1300-1600	Holiday		
22	November 14	0900-1200	urinary	Chapter 18	*Nov 15*
23	November 18	1300-1600	Reproductive development and Inheritance	Chapter 19 & 20	*Nov 19*
24	November 21	0900-1200	Endocrine	Chapter 10	
25	November 25	1300-1600	Endocrine	Chapter 10	*Nov 26*
26	November 28	0900-1200	Nervous System	Chapter 8	
27	December 2	1300-1600	Nervous System	Chapter 8	*Dec 3*
28	December 5	0900-1200	Lymphatic and Immune System	Chapter 14	
29	December 9	1300-1600	Lymphatic and Immune System	Chapter 14	*Dec 10*
30	December 12	0900-1200	Special Senses	Chapter 9	*Dec 13*
31	**December 16**	**1300-1600**	**Final Exam -30%**	**Ch 8,9,10,14,16,18.19.& 20**	

All classes are held in Room 195

Areas of Focus

Guiding Questions

Chapter I – An Introduction to Anatomy and Physiology

1. Know the basic functions of living organisms.
2. Define anatomy and physiology
3. Identify levels of organization within a living organism.
4. List the 11 organ systems of the body and briefly explain the major function(s) of each system.
5. List and define the functional characteristics important to maintaining life in humans.
6. Define the concept of homeostasis and explain its importance.
7. Compare and contrast negative and positive feedback systems and describe the role of each in maintaining body homeostasis.
8. Describe the anatomical position.
9. Use correct anatomical terminology to describe body directions, regions, and body planes or sections.
10. Locate and name the major body cavities and their subdivisions, and list the major organs contained within them.
11. Name the specific serous membranes and common function.
12. Name the nine regions and four quadrants of the abdominopelvic cavity and list the organs they contain.

Chapter 2 – The Chemical Level of Organization

1. Describe an atom and its subatomic parts.
2. Describe three types of chemical bonds.
3. Describe three types of chemical reactions.
4. Differentiate between acids and bases.
5. Differentiate between organic and inorganic compounds.
6. Describe types and functions of carbohydrates.
7. Describes types and functions of lipids.
8. Describe types and functions of proteins.
9. Describe nucleic acids and their functions.
10. Describe high-energy compounds.

Chapter 3 – Cell Structure and Function

1. Describe a cell.
2. List the three major regions of a generalized cell and indicate the general function of each region.
3. Describe the functions of the cell membrane and its structure.
4. Describe active and passive transport mechanisms.
5. Define diffusion.
6. Define osmosis and osmotic pressure.
7. Define filtration.
8. Describe the differences between types of solutions.
9. Describe carrier-mediated transport.
10. Describe types of vesicular transport.
11. Describe cytoplasm and the composition of the cytosol:
12. Name and describe the structure and function of cytoskeletal elements.
13. List the organelles, their structures and functions.
14. Define inclusions and list some types.
15. Describe functions of the cell nucleus.
16. Briefly list the phases of the cell life cycle, and describe the events of each phase.
17. Describe protein synthesis.
18. Describe transcription and translation.
19. Define mitosis.
20. Define differentiation.

Chapter 4 – The Tissue Level of Organization

1. Identify and describe the four main types of tissue.
2. Describe the types and functions of epithelial tissue.
3. Describe the relationship between the form and function of each type of epithelium.
4. Compare the structure and function of tight junctions, desmosomes, and gap junctions.
5. Compare the structures and functions of various types of connective tissue.
6. Explain how epithelial and connective tissues combine to form four types of membranes and specify the functions of each.
7. Describe three types of muscle tissue and the special structures of each.
8. Describe the basic structure and role of nervous tissue.
9. Outline the process of tissue repair involved in normal healing of a superficial wound.
10. Briefly describe tissue changes that occur with age.

Chapter 5 – The Integumentary System

1. Describe the general functions of the Integumentary system
2. Name the main structural features of the epidermis and the functional significance of each.
3. Name the specific layers of the dermis and describe their function.
4. Describe the factors that normally contribute to skin color. Briefly describe how changes in skin color may be used as clinical signs or certain disease states.
5. Identify and describe the functions of accessory structures; hair, and hair follicles.
6. Compare the structure and most common location of sweat and oil glands. Also, compare the composition and functions of their secretions.
7. Compare and contrast eccrine and apocrine glands.
8. Describe the structure of nails.
9. Describe how the skin maintains homeostasis and responds to injury and repairs itself.
10. Briefly describe the changes that occur in the skin from birth to old age.

Chapter 6 – The Skeletal System

1. List and describe the functions of skeletal system.
2. Compare and contrast the structure of the four bone classes and provide examples of each class.
3. Describe the gross anatomy of a typical long bone. Indicate the locations and functions of bone marrow, periosteum, and endosteum.
4. Briefly compare and contrast the two types of bone formation intramembranous and endochondral ossification.
5. Describe the process of long bone growth that occurs at the epiphyseal plates.
6. Describe the timing and cause of changes in bone architecture and bone mass through life.
7. Describe types of fracture and how bone remodels.
8. Name the major parts of the axial and appendicular skeletons and describe their relative functions.
9. Name and identify the bones of the skull.
10. Compare and contrast the major functions of the cranium and the facial skeleton.
11. Define fontanels and indicate their importance
12. Describe the general structure of the vertebral column, list its components, and describe its curvatures.
13. Indicate common function of the spinal curvatures and the intervertebral discs...
14. Name and describe the bones of the bony thorax.
15. Differentiate true from false ribs.
16. Identify the bones of the pectoral and pelvic girdles and relate to their structural and functional differences
17. Identify or name the bones of the upper limb and their important markings.
18. Identify the bones of the lower limb.
19. Define joint or articulation.
20. Classify joints structurally and functionally.
21. Name and describe (or perform) the common body movements.
22. Explain the relationship between joint structure and mobility
23. Discuss briefly the factors that promote or disturb joint homeostasis.

Chapter 7 – The Muscular System

1. List important functions of muscle tissue.
2. Describe the gross structure of a skeletal muscle with respect to location and names of its connective tissue coverings and attachments.
3. Describe the microscopic structure and functional roles of the myofibrils, sarcoplasmic reticulum, and T tubules of skeletal muscle fibers (cells).
4. Name and describe two types of skeletal muscle fibers
5. Compare skeletal, smooth and cardiac muscle.
6. Be aware of the gross and microscopic anatomy of cardiac and smooth muscle fibers as they compare to skeletal muscle fibers.
7. Explain the sliding filament mechanism of skeletal muscle contractions.
8. Define neuromuscular junction and explain how muscle fibers are stimulated to contract.
9. Define muscle twitch and describe the events occurring during its three phases.
10. Explain how smooth, graded contractions of a skeletal muscle are produced.
11. List and describe factors that influence the force, velocity, and duration of skeletal muscle contraction
12. Describe three ways in which ATP is regenerated during skeletal muscle contraction.
13. Define muscle fatigue. List possible causes of muscle fatigue.
14. Compare and contrast the effects of aerobic and resistance exercise on skeletal muscles and on other body systems.
15. List and define the ways that muscles are named and identify common muscles, including those pertinent to nursing.
16. Explain the function of prime movers, antagonists, synergists, and fixators, and describe how each promotes normal muscular function.
17. Describe effects of aging on the muscular system.

Chapter 11 - CV System: Blood

1. List the functions of blood.
2. Describe the composition and physical characteristics of whole blood. Explain why it is classified as a connective tissue.
3. Discuss the composition and functions of plasma.
4. Describe the structural characteristics, function, and production of erythrocytes.
5. List the classes, structural characteristics, and functions of leukocytes.
6. Describe the structure and function of platelets.
7. Discuss the structure and function of hemoglobin.
8. Describe the ABO and Rh blood groups. Explain the basis of transfusion reactions.
9. Explain the importance of blood testing as a diagnostic tool.
10. Describe the process of homeostasis. List the factors that limit clot formation and prevent undesirable clotting.
11. Give examples of disorders caused by abnormalities of each of the formed elements.
12. Describe the mechanisms that reduce blood loss after an injury.

Chapter 12 - CV System: The Heart

1. Describe the circuits of the cardiovascular system.
2. Describe the size and shape of the heart, and indicate its location and orientation in the thorax.
3. Name the coverings of the heart.
4. Describe the structure and functions of the four heart chambers.
5. Name each chamber and provide the name and general route of its associated great vessel(s).
6. Describe the structural and functional properties of cardiac muscle.
7. Trace the pathway of blood through the heart.
8. Name the heart valves and describe their location, function, and mechanism of operation.
9. Name the major branches of the coronary arteries and describe their distribution.
10. Name the components of the conduction system of the heart, and trace the conduction pathway.
11. Briefly describe the events of cardiac muscle cell contraction.
12. Name the components of the conducting system of the heart, and trace the conduction pathway.
13. Draw a diagram of a normal electrocardiogram tracing: name the individual waves and intervals, and indicate what each represents.
14. Describe the timing and events of the cardiac cycle.
15. Describe normal heart sounds.
16. Name and explain the effects of the various factors involved in regulation of stroke volume and heart rate.
17. Define cardiac output.
18. Describe factors that affect cardiac output
19. Explain the role of the autonomic nervous system and hormones in regulating cardiac output.

Chapter 13 - CV System: The Blood Vessels and Circulation

1. Describe the three layers that typically form the wall of a blood vessel, and state the function of each.
2. Compare and contrast the structure and function of the three types of arteries.
3. Describe the structure and function of a capillary bed.
4. Describe the structure and function of veins, and explain how veins differ from arteries.
5. Trace the pathway of blood through the pulmonary circuit, and state the importance of this special circulation.
6. Describe the general functions of the systemic circuit. Name and give the location of the major arteries and veins in the systemic circulation.
7. Describe the structure and special function of the hepatic portal system.
8. Describe fetal circulation and changes after birth.
9. Define vasoconstriction and vasodilation.
10. Define blood flow, blood pressure, and resistance, and explain the relationships between these factors.
11. List and explain the factors that influence circulatory pressure.
12. Describe systolic, diastolic and pulse pressure and explain elastic rebound.
13. Describe capillary pressure and capillary exchange.
14. Explain edema and congestive heart failure.
15. Explain effects of venous pressure.
16. Describe factors involved in regulation of cardiovascular function.
17. Describe autoregulation of blood flow.
18. Describe the neural control of blood pressure and blood flow.
19. List and describe effects of hormones on cardiovascular regulation.
20. Describe the effects of exercise on the cardiovascular system.
21. Describe short and long term methods of restoring blood pressure during hemorrhage.
22. Provide examples of changes that often occur in blood vessels as a person ages.

Chapter 15 - The Respiratory System

1. Describe the primary functions of the respiratory system.
2. Identify the organs forming the respiratory passageway(s) in descending order until the alveoli are reached.
3. Distinguish between conducting and respiratory zone structures.
4. List and describe several protective mechanisms of the respiratory system.
5. Describe the makeup of the respiratory membrane, and relate its structure to its function.
6. Describe the gross structure of the lungs and pleural coverings
7. Describe the three steps in process of respiration
8. Define hypoxia, anoxia, inspiration, and expiration.
9. Explain the relative roles of the respiratory muscles and lung elasticity in effecting volume changes that cause air to flow into and out of the lungs.
10. Compare quiet and forced breathing.
11. Explain and compare the various lung volumes and capacities. Indicate type of information that can be gained from pulmonary function tests.
12. Describe, in general terms differences in composition of atmospheric and alveolar air, and explain these differences.
13. Describe external and internal respiration.
14. Describe how oxygen is transported in the blood, and explain how oxygen loading and unloading is affected by temperature, pH, and Po_2.
15. Describe carbon dioxide transport in the blood.
16. Describe the local controls of respiration.
17. Compare and contrast the influences of lung reflexes, volition, emotions, arterial pH, and partial pressures of oxygen and carbon dioxide in arterial blood on respiratory rate and depth.
18. Describe normal changes that occur in the respiratory system from infancy to old age.

Chapter 16 - The Digestive System

1. Identify and describe functions of the organs of the digestive tract and accessory organs.
2. Describe the overall function of the digestive system.
3. Describe the tissue composition and the general function of each of the four layers of the alimentary tube.
4. Explain the dental formula and differentiate clearly between deciduous and permanent teeth.
5. Identify structural modifications of the wall of the stomach and small intestine that enhance the digestive process in these regions.
6. List and define briefly the major processes occurring during digestive system activity.
7. Describe the composition and functions of saliva, and explain how salivation is regulated.
8. Describe the mechanisms of chewing and swallowing.
9. Describe the composition of gastric juice, name the cell types responsible for secreting its various components, and indicate the importance of each component in stomach activity.
10. Explain how gastric secretion and motility in the stomach are regulated through the phases of digestion.
11. Describe the reflexes that effect intestinal movements.
12. List the function of local hormones produced by the small intestine.
13. Describe the digestion that occurs in the small intestine.
14. Describe the structure and functions of the pancreas, liver, and gallbladder and explain how their activities are regulated.
15. List the major functions of the large intestine, and describe its movements and absorptive functions
16. List the enzymes involved in chemical digestion: name the food type on which they act and the end products of protein, fat, carbohydrate, and nucleic acid digestion.
17. Describe important changes of the gastrointestinal tract at different stages of life.

Chapter 18 - The Urinary System

1. Identify the essential functions of the urinary system.
2. Describe the gross anatomy of the kidney and its coverings.
3. Trace the blood supply through the kidney.
4. Describe the anatomy of a nephron.
5. Identify the parts of the nephron responsible for filtration, reabsorption, and secretion.
6. Describe the general structure and function of the ureters.
7. Describe the general structure and function of the urinary bladder.
8. Describe the general structure and function of the urethra.
9. Compare the course, length, and functions of the male urethra with those of the female.
10. Define micturition and describe the micturition reflex.
11. List several urinary system functions that help maintain body homeostasis.
12. Describe the processes involved in urine production.
13. List two factors that affect filtration.
14. Explain the formation of dilute versus concentrated urine.
15. Describe the normal physical and chemical properties of urine.
16. Explain role of aldosterone and ADH on urine production.
17. Define fluid, electrolyte and acid-base balance.
18. Describe fluid balance in terms of intra and extra cellular fluid.
19. Define acidosis and alkalosis.
20. Describe the three buffer systems and their functions.
21. Describe factors that help maintain acid-base balance.
22. Describe the most frequent threats to acid-base balance.
23. List several changes in urinary system anatomy and physiology that occur with age.

Chapter 9 – The Reproductive System

1. Describe the common function of the male and female reproductive systems.
2. Describe the structure and function of the testes and explain the importance of their location in the scrotum.
3. Describe the location, structure, and function of the accessory organs of the male reproductive system.
4. Describe the structure of the penis and note its role in the reproductive process.
5. Describe the location, structure, and function of each of the organs of the female reproductive system.
6. Describe the anatomy of the female external genitalia.
7. Discuss the structure and function of the mammary glands.
8. Define meiosis. Compare and contrast to mitosis.
9. Outline the events of spermatogenesis.
10. List the elements in semen and explain the specific functions of each.
11. Discuss hormonal regulation of testicular function and the physiological effects of testosterone on male reproductive anatomy.
12. Describe the process of oogenesis and compare it to spermatogenesis.
13. Describe the phases of the ovarian cycle, and relate them to events of oogenesis.
14. Describe the regulation of the ovarian and menstrual cycles.
15. Discuss the physiological effects of estrogens and progesterone.
16. Briefly the physiology of intercourse.
17. Note the significant events of puberty and menopause.

Chapter 20 – Development and Inheritance

1. Define fertilization
2. Briefly describe the processes of implantation and placenta formation, and list placental functions.
3. Describe the major developmental changes to the fetus during each trimester.
4. Describe changes in maternal reproductive organs, and in cardiovascular, respiratory, and urinary system functioning during pregnancy.
5. Explain how labor is initiated and describe the three stages of labor.
6. Describe the changes that occur in fetal circulation after birth.
7. Explain how lactation occurs.
8. Differentiate between an embryo and a fetus, neonate, infant, child and adolescent.

Chapter 10 the Endocrine System

1. List the major endocrine organs; describe their locations in the body.
2. Describe the structural and functional relationships between the hypothalamus and the pituitary gland.
3. Indicate important differences between hormonal and neural controls of body
4. Describe how hormones are classified chemically.
5. Describe hormones and list 3 types.
6. Distinguish between circulating hormones and local hormones.
7. Describe the two major mechanisms by which hormones bring about their effects on their target tissues, and explain how hormone release is regulated.
8. List and describe the chief effects of anterior pituitary hormones.
9. Discuss the structure of the posterior pituitary and describe the effects of the two hormones it releases.
10. Describe the important effects of the two groups of hormones produced by the thyroid gland. Follow the process of thyroxine formation and release.
11. Indicate the general functions of parathyroid hormone.
12. List the hormones produced by the cortical and medullary regions of the adrenal gland, and cite their physiological effects.
13. Compare and contrast the effects of the two major pancreatic hormones.
14. Briefly describe the importance of thymic hormones in the operation of the immune system.
15. Briefly explain the hormonal functions of the kidney and the pineal gland.
16. Describe the functional roles of the hormone products of the testes, ovaries, placenta and adipose tissue.
17. Describe the patterns of hormonal interaction and their effects on growth and behavior.
18. Describe the effect of aging on endocrine system functioning

Chapter 8 The Nervous System

1. List the basic functions of the nervous system.
2. Explain the structural and functional divisions of the nervous system.
3. List the types of supporting cells and cite their functions.
4. Describe the important anatomical regions of a neuron and relate each to a physiological role.
5. Classify neurons structurally and functionally.
6. Explain the importance of the myelin sheath and describe how it is formed in the central and peripheral nervous systems.
7. Differentiate between a nerve and a tract, and between a nucleus and ganglion.
8. Describe the types of neuralgia.
9. Define resting membrane potential and describe its electrochemical basis.
10. Compare and contrast graded and action potentials.
11. Explain how action potentials are generated and propagated along neurons.
12. Define absolute and relative refractory periods.
13. Define saltatory propagation and contrast it to conduction along unmyelinated fibers.
14. Define synapse. Distinguish between electrical and chemical synapses structurally and in their mechanisms of information transmission.
15. Distinguish between excitatory and inhibitory post-synaptic potentials.
16. Describe how synaptic events are integrated and modified.
17. Define neurotransmitter and name several classes of neurotransmitter.
18. Describe common patterns of neuronal organization and processing.

Chapter 8 The Central Nervous System

1. Explain lateralization of hemisphere function.
2. List the major spinal cord tracts, and describe each in terms of its origin, termination, and function
3. Identify the three major regions of the brain stem, and note the general function of each area.
4. Describe the structure and function of the cerebellum.
5. Describe the role and functions of the basal nuclei
6. Localize the limbic system and the reticular formation and explain the role of each functional system.
7. Distinguish between types of paralysis.
8. Describe an EEG.
9. Differentiate between types of memory.
10. Describe the structures and functions of the Diencephalons, midbrain, pons, cerebellum and medulla oblongata.
11. Describe how meninges, cerebrospinal fluid, and the blood brain barrier protect the central nervous system.
12. Describe the gross and microscopic structure of the spinal cord.
13. Name the major regions of the adult brain.
14. Define the term ventricle and indicate the location of the ventricles of the brain.
15. List the major lobes, and functional areas of the cerebral cortex.

Chapter 8 The Peripheral Nervous System

1. Define peripheral nervous system and list its components.
2. Name the 12 pairs of cranial nerves and describe the body region and structures innervated by each.
3. Describe the structure of the spinal nerves.
4. Define dermatone and explain function.
5. Define plexus. Name the major plexuses, their origin sites, and their area of innervations.
6. Define reflex. Define simple and complex reflexes and give examples of each.
7. Describe how spinal reflexes are controlled.
8. List nerve plexuses and areas they innervate.
9. Compare and contrast stretch, flexor, and crossed extensor reflexes.
10. List and describe the sensory and motor pathways and explain their mechanisms.
11. Compare and contrast the motor endings of somatic and autonomic nerve fibers.
12. Distinguish between autonomic and somatic reflexes.

Chapter 8 The Autonomic Nervous System

1. Compare the somatic and autonomic nervous systems relative to effectors, efferent pathways, and neurotransmitter divisions.
2. Describe the site of CNS origin, locations of ganglia, and general fiber pathways of parasympathetic and sympathetic divisions.
3. Compare and contrast the general functions of the parasympathetic and sympathetic divisions.
4. Define cholinergic and adrenergic fibers, and list the different types of cholinergic and adrenergic receptors.
5. Briefly describe the clinical importance of drugs that mimic or inhibit adrenergic or cholinergic effects.
6. State the effects of the parasympathetic and sympathetic divisions on the following organs: heart, blood vessels, gastrointestinal tract, lungs, adrenal medulla, and external genitalia.
7. Describe the levels of control of autonomic nervous system functioning.
8. Describe the effects of aging on the autonomic nervous system

Chapter 14 - The Lymphatic System and Immunity

1. Describe the organization and function of the lymphatic system.
2. List the body's non specific defenses and how this functions.
3. Describe the source of lymph and mechanism(s) of lymph transport.
4. Describe lymphocytes and list three types with their functions.
5. Describe lymph nodules and give examples.
6. Name the major lymphoid organs and define their function.
7. Describe the general location, histological structure, and functions of lymph nodes.
8. Describe the surface membrane barriers and their protective functions.
9. Explain the two categories of body defense mechanisms.
10. Relate the events of the inflammatory process. Identify several inflammatory chemicals and describe their specific roles.
11. Describe the role of macrophages and other phagocytes in immunity.
12. Explain how fever helps protect the body against invading pathogens.
13. List and describe the body's specific immune responses.
14. List and describe the forms of immunity.
15. Describe the properties of immunity.
16. Describe cell-mediated immunity.
17. List and describe types of T cells.
18. Describe antibody-mediated immunity.
19. Describe antibody structure and how it works with antigens
20. List and briefly describe types of antibodies.
21. List and describe antibody functions.
22. Describe primary and secondary response.
23. List types of hormones in the immune system.
24. List and describe types of immune disorders.

Chapter 9 - The General and Special Senses

1. Distinguish between the general senses and the special senses.
2. Identify the receptors for the general senses and describe how they function.
3. Describe sensation and adaptation.
4. List three classes of mechanoreceptors and describe functions of each.
5. Differentiate between the three types of pain and give examples of each.
6. Describe the location and structures of taste and smell receptors, and explain how these receptors are activated Describe mechanism of chemical detection.
7. Describe the structure and function of accessory eye structures, eye tunics, lens, and humors of the eye.
8. Explain how we are able to see objects and distinguish colours.
9. Compare and contrast light and dark adaptation.
10. Briefly note the cause and consequences of astigmatism, cataract, glaucoma, hyperopia, myopia, and color blindness.
11. Describe the structure and general function of the outer, middle, and inner ear.
12. Describe the hearing process.
13. Describe the two types of equilibrium.
14. Briefly list possible causes and symptoms of otitis media, deafness, Meniere's syndrome, and motion sickness.
15. List changes that occur in these special organs with aging.