

MT-1272: SOMATIC STUDIES II

Cuyahoga Community College

Viewing: MT-1272 : Somatic Studies II

Board of Trustees:

May 2024

Academic Term:

Fall 2024

Subject Code

MT - Massage Therapy

Course Number:

1272

Title:

Somatic Studies II

Catalog Description:

Study of human anatomy and physiology for students of massage therapy. Specific emphasis on fundamental concepts of muscular system, nervous system, spinal cord, nerve plexus, brain, sensory and motor pathways, special senses, autonomic nervous system, endocrine, cardiovascular.

Credit Hour(s):

3

Lecture Hour(s):

2

Lab Hour(s):

2

Requisites

Prerequisite and Corequisite

MT-1242 Fundamentals of Somatic Studies I, or departmental approval.

Outcomes

Course Outcome(s):

A. Apply knowledge of anatomy and physiology as it relates to the muscular system and articulations.

Objective(s):

1. Distinguish between the different types of muscle tissue and their functions.
2. Describe the anatomy and physiology of skeletal muscle with emphasis on muscle tension, metabolism, tone, and regeneration.
3. Define the classification system and each division's structure and function of the nervous system.

Course Outcome(s):

B. Apply knowledge of anatomy and physiology as it relates to the autonomic nervous system (ANS), including spinal cord, brain, sensory receptors, and sympathetic and parasympathetic divisions.

Objective(s):

1. Describe the structure and function of the spinal cord and spinal nerves.
2. Identify the major parts of the brain and their function.
3. Explain the sensations, sensory receptors, sensory, motor and integrative systems.
4. Classify and explain the different sensations in the human body.
5. Describe the structure and function of sympathetic and parasympathetic divisions of ANS.
6. Explain the basic concept of neurological laws.

Course Outcome(s):

C. Apply knowledge of anatomy and physiology as it relates to the endocrine and cardiovascular systems.

Objective(s):

1. Describe the regulatory role of the endocrine system in maintaining homeostasis.
 2. Describe the structure and function of the heart, circulatory system, and cardiac cycle.
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Methods of Evaluation:

1. Lecture examinations
2. Laboratory examinations
3. Quizzes
4. Participation
5. Case studies
6. Homework

Course Content Outline:

1. Muscle tissues
 1. Type
 - a. cardiac
 - b. smooth
 - c. skeletal
 2. Functions
 3. Properties
 4. Skeletal muscle anatomy
 - a. connective tissue components
 - b. nerve and blood supply
 - c. microscopic anatomy
 - i. sarcolemma, t tubule, sarcoplasm
 - ii. myofibrils, sarcoplasmic, reticulum
 - iii. sarcomere, filaments
 - iv. muscle proteins
 - d. physiology of skeletal muscle fibers
 - i. sliding filament mechanism
 - i. contraction cycle
 - ii. excitation - contraction coupling
 - iii. length - tension relationship
 - ii. active - passive tension
 - iii. neuromuscular junction
 - i. structure
 - ii. function
 - iv. muscle metabolism
 - i. creative phosphate metabolism
 - ii. anaerobic metabolism
 - iii. aerobic metabolism
 - iv. muscle fatigue
 - v. oxygen debt
 - v. control of muscle tension
 - i. motor unit
 - ii. twitch construction
 - iii. frequency of stimulation
 - i. wave summation
 - ii. unfused tetanus
 - iii. fused tetanus
 - iv. motor unit recruitment
 - v. muscle tone
 - vi. isotonic contractions

- i. concentric
 - ii. eccentric
 - vii. isometric contractions
 - vi. types of skeletal muscle fibers
 - i. slow oxidative fibers
 - ii. fast oxidative - glycolytic fibers
 - iii. fast glycolytic fibers
 - vii. regeneration of muscle tissue
2. Nervous tissue
1. Overview
 - a. structure
 - b. function
 2. Histology
 - a. neurons
 - b. neuroglia
 - c. myelination
 - d. gray and white matter
 3. Electric signals
 - a. ion channels
 - b. resting membrane potential
 - c. graded potential
 - d. action potential
 4. Signal transmission
 - a. chemical synapse
 5. Neurotransmitters
 - a. acetyl choline
 - b. amino acids
 - c. biogenic amines
 - d. ATP
 - e. gases
 - f. neuropeptides
 6. Neuronal circuits
 - a. converging
 - b. diverging
 - c. reverberating
 - d. parallel after discharge
 7. Regeneration and repair
3. Spinal cord and spinal nerves
1. Anatomy
 - a. external anatomy
 - b. internal anatomy
 - c. meninges
 2. Physiology
 - a. sensory tracts
 - b. motor tracts
 - c. reflexes
 3. Spinal nerves
 - a. connective tissues
 - b. distribution
 - i. branches
 - ii. cervical plexus
 - iii. lumbar plexus
 - iv. sacral plexus
 - v. intercostal nerves
 4. Dermatomes
4. Brain and cranial nerves

1. Organization
 - a. principal parts
 - b. meninges
 - c. blood supply
2. Cerebral Spinal Fluid
 - a. production
 - b. circulation
3. Brain stem
 - a. medulla oblongata
 - b. pons
 - c. midbrain
 - d. reticular formation
4. Cerebellum
5. Diencephalon
6. Cerebrum
 - a. lobes
 - b. cerebral white matter
 - c. basal ganglia
 - d. limbic system
7. Functional aspects
 - a. sensory areas
 - b. motor areas
 - c. association areas
 - d. lateralization
 - e. brain waves
8. Cranial nerves
5. Sensory, motor and integrative systems
 1. Sensation
 - a. modalities
 - b. process
 - c. adaptation of different types
 2. Somatic sensations
 - a. tactile
 - b. thermal
 - c. pain
 - d. proprioception
 3. Somatic sensory pathways
 4. Somatic motor pathways
 5. Integrative functions
 - a. wakefulness
 - b. sleep
 - c. reticular activating system
6. Special senses
 1. Olfaction
 - a. anatomy
 - b. physiology
 - c. thresholds
 - d. adaptation
 - e. pathway
 2. Gustation
 - a. anatomy
 - b. physiology
 - c. threshold
 - d. adaptation
 - e. pathway
 3. Vision
 - a. accessory structures
 - b. anatomy
 - c. image formation

- d. convergence
- e. physiology
- 4. Hearing and equilibrium
 - a. anatomy
 - b. nature of sound waves
 - c. physiology
 - d. pathway
 - e. physiology of equilibrium
 - f. equilibrium pathways
- 7. Autonomic Nervous System
 - 1. Anatomy
 - a. anatomical components
 - i. preganglionic neurons
 - ii. autonomic ganglia
 - iii. autonomic plexus
 - iv. postganglionic neurons
 - 2. ANS neurotransmitters and receptors
 - a. cholinergic neurons and receptors
 - b. adrenergic neurons and receptors
 - c. receptor agonist and antagonist
 - 3. Physiological effects of ANS
 - a. sympathetic responses
 - b. parasympathetic responses
 - 4. Integration and control of autonomic functions
 - a. autonomic reflexes
 - b. autonomic control by higher centers
 - 8. Endocrine system
 - 1. Hormones
 - a. definition
 - b. circulating and local
 - c. chemical classes
 - i. lipid soluble
 - ii. water soluble
 - d. mechanism
 - 2. Hypothalamus
 - 3. Pituitary gland
 - a. anterior pituitary hormones
 - b. posterior pituitary hormones
 - 4. Action of thyroid gland hormones
 - 5. Action of parathyroid glands hormones
 - 6. Action of adrenal glands hormones
 - 7. Action of pancreatic hormones
 - 8. Action of pineal gland hormone
 - 9. Action of thymus gland hormone
 - 10. Stages of general adaptation syndrome
 - 9. Cardiovascular system
 - a. Blood
 - i. Functions and Properties of Blood
 - ii. Formation of Blood Cells
 - iii. Red Blood cells
 - iv. White Blood Cells
 - v. Platelets
 - vi. Hemostasis
 - vii. Blood Groups and Blood Types
 - b. Heart
 - i. structure
 - ii. function
 - iii. circulation
 - c. Cardiac muscle

- i. histology
- ii. physiology
- d. ECG
- e. Cardiac cycle
 - i. phases
 - ii. heart sounds
- f. Cardiac output
 - i. regulation of stroke volume
 - ii. regulation of heart rate

Resources

Allen, Colleen & Harper, Valerie. *A Laboratory Manual for Anatomy & Physiology*. 7th ed. Wiley & Sons, 2021.

Tortora, Gerald J. and Derrickson, Bryan H. *Principles of Anatomy and Physiology*. 16th ed. Wiley Publishers, 2020.

Goldberg, Stephen. *Clinical Physiology Made Ridiculously Simple*. 2nd ed. MedMaster Inc., 2019.

Goldberg, Stephen & Ouellette, Hugue. *Clinical Anatomy Made Ridiculously Simple*. 4th ed. MedMaster Inc., 2016.

Resources Other

1. Wiley Plus Website

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