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A plan to assess student learning in a University General Education Core Curriculum course: BIOL2443/BIOL2441L Human Anatomy and Human Anatomy Laboratory

WHAT UNIVERSITY GENERAL EDUCATION OUTCOMES GUIDE STUDENT LEARNING IN COURSES THAT CARRY NATURAL SCIENCES CREDIT?

A primary goal of these courses is to develop an appreciation of the basic principles that govern natural phenomena and the role of experiment and observation in revealing these principles. Students should acquire an understanding of the relationship between hypothesis, experiment, and theory, and develop the skills common to scientific inquiry, including the ability to frame hypotheses and defend conclusions based on the analysis of data. These courses are designed to prepare a student for informed citizenship by illustrating the importance of science and technology to the present and future quality of life and the ethical questions raised by scientific and technological advances.

Upon completion of eight hours of science courses, students will:

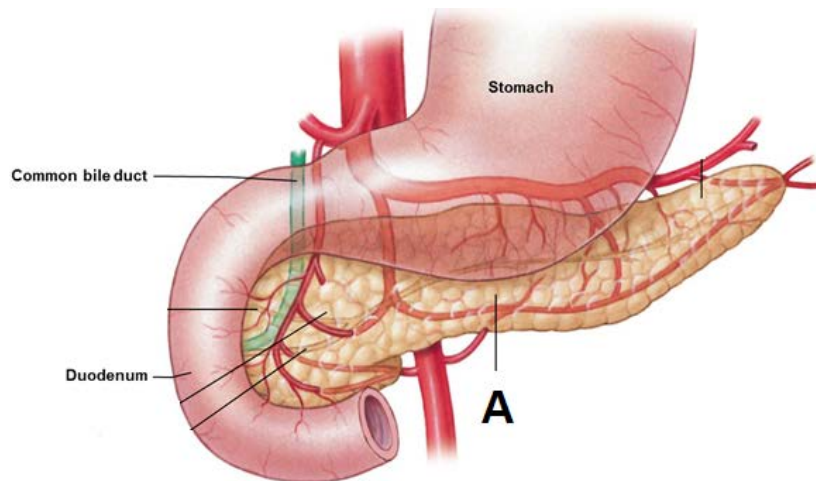
- NSLO1a - Understand how scientific inquiry is performed.
- NSLO2a - Understand the boundaries of scientific data.
- NSLO3a - Have a basic working knowledge of a few areas of science.
- NSLO4a - Be able to make better-informed decisions regarding potential government policies that involve science.
- NSLO5a - Have improved problem solving skills.
- NSLO6a - Be able to identify challenges created by society's increasing reliance upon technology.

HOW DOES THE DEPARTMENT OF BIOLOGICAL SCIENCES INTEND TO ASSESS STUDENT LEARNING OF THESE OUTCOMES IN BIOL2443/BIOL2441L?

BIOL2443/BIOL2441L (Human Anatomy and Human Anatomy Laboratory) is a lecture and laboratory course. The assessment consists of a pre-test at the start of the semester followed by a post-test near the end of the semester. Assessment exams included 50 questions composed and agreed upon by the faculty teaching BIOL2443. The questions were designed to be overarching and related to broad thematic components of the course. Analysis of student performance will be based on overall performance on the exam, not on the individual questions. The same assessment exam will be used for multiple semesters so that performance over time can be compared.

HOW IS THE ASSESSMENT INSTRUMENT KEYED TO THE UNIVERSITY GENERAL EDUCATION CORE CURRICULUM LEARNING OUTCOMES FOR THE NATURAL SCIENCES?

Human Anatomy Assessment



- 1. How is the function of the organ, labeled A, similar to the stomach in regards to digestion?**
 - A. Mechanically breaks down food for optimum digestion
 - B. Releases sodium bicarbonate in response to increased hormones from the small intestines
 - C. Major site for nutrient absorption
 - D. Produces bile which emulsifies fat
 - E. Storage site for bile

NSLO1a; NSLO5a

- 2. The levels of structural organization of the human body in order of increasing complexity are _____.**
 - A. chemical, cellular, tissue, organ, organ system, organismal.
 - B. atomic, molecular, cellular, tissue, organ system, organ.
 - C. organismal, organ system, organ, tissue, cellular, chemical.
 - D. species, genus, family, order, class, phylum, kingdom.
 - E. cellular, chemical, tissue, organ, organismal, organ system.

NSLO2a; NSLO3a; NSLO5a

- 3. During illness, structures in our body could undergo change. Which branch of anatomy specifically studies this phenomenon?**
 - A. radiographic anatomy
 - B. clinical anatomy
 - C. surgical anatomy
 - D. All the listed responses are correct

NSLO3a; NSLO4a; NSLO5a

4. The control center for the cell, which is responsible for transmitting genetic information and providing instructions for protein synthesis, is:

- A. the nucleolus
- B. DNA
- C. the nucleus
- D. mitochondria
- E. ribosomes

NSLO2a; NSLO3a; NSLO5a

5. If a cell lacked lysosomes, what vital process would not occur?

- A. formation of soluble proteins for use in the cytosol
- B. lipid metabolism and steroid synthesis
- C. transport of vesicles
- D. digestion of unwanted substances by enzymes such as acid hydrolase
- E. neutralization of free radicals

NSLO1a; NSLO2a; NSLO3a; NSLO5a

6. Which muscle tissue is characterized by cells having striations and many nuclei?

- A. cardiac muscle
- B. skeletal muscle
- C. smooth muscle
- D. All of the listed responses are correct.

NSLO3a; NSLO5a

7. The functions of simple squamous epithelial tissues include which of the following:

- A. distension
- B. absorption, secretion, and ion transport
- C. diffusion, filtration, and secretion
- D. secretion, absorption, and propelling mucus
- E. secretion of mucus and/or enzymes

NSLO3a; NSLO5a

8. Which of the following is a component of the integumentary system?

- A. kidney, ureter, and urethra
- B. spleen, lymphocytes, and lymphatic vessels
- C. skin, hair, nails, and sweat glands
- D. heart, blood, and blood vessels

NSLO1a; NSLO3a

9. Which of the following is considered the function of the integumentary system?

- A. regulate body temperature
- B. serve as a physical barrier
- C. function in immune defense
- D. All of the listed responses are correct.

NSLO1a; NSLO5a

10. Which of the following is a function of the skeletal system?

- A. protection
- B. leverage
- C. support
- D. All of the listed responses are correct.

NSLO1a; NSLO5a

11. Which cells in bone are considered "bone forming" because they secrete the organic components of the bone matrix?

- A. osteoclasts
- B. osteocytes
- C. osteoblasts
- D. osteoid

NSLO2a; NSLO5a

12. What structure protects the pituitary gland?

- A. crista galli
- B. ethmoidal labyrinth
- C. sella turcica
- D. palatine bone

NSLO1a; NSLO2a; NSLO3a; NSLO5a

13. What does a pathologist investigate?

- A. early development of cells
- B. tissues
- C. cells
- D. diseases

NSLO3a; NSLO4a

14. Water comprises what percentage of the molecular composition of the human body?

- A. 95%
- B. 75%
- C. 65%
- D. 25%

NSLO1a; NSLO2a; NSLO5a

15. Which of the following bones is NOT part of the upper limb?

- A. ulna
- B. clavicle
- C. radius
- D. humerus

NSLO1a

16. Which type of joint is specialized for movement and permits a wide range of motion?

- A. amphiarthrosis
- B. diarthrosis
- C. synarthrosis
- D. None of the listed responses is correct.

NSLO1a; NSLO3a

17. Ashton loves to stand on his tiptoes. What type of special movement best describes the elevation of the heel and proximal portion of the foot when a person stands on tiptoes?

- A. plantar flexion
- B. eversion
- C. dorsiflexion
- D. lateral flexion

NSLO1a; NSLO2a; NSLO3a; NSLO4a; NSLO5a

18. Which of the following is/are considered function(s) of skeletal muscle?

- A. maintain body temperature
- B. produce skeletal movement
- C. maintain posture and body position
- D. All the listed responses are correct.

NSLO1a, NSLO5a

19. What is muscle tone?

- A. a single contraction
- B. muscle recruitment
- C. the resting tension of skeletal muscles
- D. the reduction in muscle size, tone, and power

NSLO1a; NSLO3a; NSLO5a

20. Cranial nerve IV, the trochlear nerve, innervates which eye muscle?

- A. lateral rectus muscle
- B. medial rectus muscle
- C. inferior oblique muscle
- D. superior oblique muscle

NSLO3a; NSLO5a

21. Which of the following statements is correct about scanning electron microscopy (SEM)?

- A. SEM uses acidic and basic dyes to stain structures.
- B. SEM uses a beam of light to view cellular structures.
- C. SEM is limited because it cannot produce sharp images of structures within cells.
- D. SEM provides three-dimensional pictures of whole, unsectioned surfaces.
- E. All of the statements above are true of SEM.

NSLO3a; NSLO4a; NSLO6a

22. Which muscle group is NOT part of the appendicular muscles?

- A. muscles of the upper limb
- B. muscles of the pectoral girdle
- C. muscles of the pelvic girdle
- D. None of the listed muscle groups are appendicular muscles.

NSLO1a; NSLO2a; NSLO5a

23. Which of the following muscle is NOT part of the rotator cuff?

- A. Subscapularis
- B. Supraspinatus
- C. Infraspinatus
- D. Teres major
- E. Teres minor

NSLO1a; NSLO5a

24. Which of the following is known as the visceral motor system?

- A. afferent division
- B. efferent division
- C. autonomic nervous system
- D. somatic nervous system

NSLO4a; NSLO5a

25. The afferent division begins at the _____.

- A. receptor
- B. visceral
- C. effector
- D. somatic

NSLO1a; NSLO2a; NSLO5a

26. Which division of the nervous system consists of the brain and spinal cord and the control centers responsible for processing?

- A. central nervous system
- B. peripheral nervous system
- C. autonomic nervous system
- D. All of the listed responses are correct.

NSLO1a; NSLO3a; NSLO4a; NSLO5a

27. Which cell in the central nervous system is the largest and most numerous glial cell, maintains the blood-brain barrier, provides structural support, and absorbs and recycles neurotransmitters?

- A. oligodendrocytes
- B. microglia
- C. ependymal cell
- D. astrocyte

NSLO1a; NSLO3a; NSLO5a

28. What is the outermost covering of the spinal cord and brain?

- A. pia mater
- B. dura mater
- C. arachnoid mater
- D. All of the listed responses are correct.

NSLO1a; NSLO5a

29. The arachnoid mater consists of simple squamous epithelium and is separated from the pia mater by which of the following?

- A. epidural space
- B. denticulate ligaments
- C. subdural space
- D. subarachnoid space

NSLO3a; NSLO5a

30. Which brain region contains, as its major function, relaying and processing centers for sensory information?

- A. Thalamus
- B. Mesencephalon
- C. Pons
- D. Hypothalamus

NSLO1a; NSLO3a; NSLO4a; NSLO5a; NSLO6a

31. Which of the following is a function of the cerebrospinal fluid?

- A. supporting brain
- B. transporting nutrients, chemical messengers, and waste products
- C. preventing contact between delicate neural structures and the surrounding bones
- D. All of the listed responses are correct.

NSLO1a; NSLO2a

32. Which division of the ANS gives rise to the “fight-or-flight” response?

- A. parasympathetic division
- B. sympathetic division
- C. craniosacral division
- D. None of the listed responses is correct.

NSLO1a; NSLO4a; NSLO5a; NSLO6a

33. The general functions of the parasympathetic division include which of the following?

- A. Increase smooth muscle activity along the digestive tract
- B. Reduce heart rate and force of contraction
- C. Constrict respiratory passageways
- D. All of the listed responses are correct.

NSLO1a; NSLO2a; NSLO3a; NSLO5a

34. Which of the following bones is NOT considered an auditory ossicle?

- A. Stapes
- B. Incus
- C. Petrous part of the temporal bone
- D. Malleus

NSLO2a; NSLO5a; NSLO6a

35. Which cranial nerves monitor taste buds?

- A. CN IV, CN IX
- B. CN VI, CN XII
- C. CN VI, CN XI
- D. CN VII, CN X

NSLO1a; NSLo2a; NSLO4a

36. Which general sensory receptors are stimulated or inhibited by physical distortion, contact, or pressure on their plasmalemmae?

- A. Chemoreceptors
- B. Mechanoreceptors
- C. Thermoreceptors
- D. Nociceptors

NSLO1a; NSLO3a; NSLO5a

37. Which two systems of the body work together to monitor and adjust the body's physiological activities?

- A. endocrine system and cardiovascular system
- B. endocrine system and lymphoid system
- C. endocrine system and nervous system
- D. None of the listed responses is correct.

NSLO1a; NSLO2a; NSLO3a; NSLO5a; NSLO6a

38. Melatonin is secreted by which endocrine gland?

- A. Thyroid gland
- B. Parathyroid gland
- C. Suprarenal gland
- D. Pineal gland

NSLO3a; NSLO4a

39. Which reproductive system hormone accelerates the movement of the oocyte along the uterine tube and prepares the uterus for the arrival of the developing embryo?

- A. Inhibin
- B. Estrogen
- C. Progesterone
- D. Estradiol

NSLO1a; NSLO2a; NSLO5a

40. Of the pituitary hormones, which one affects the reabsorption of water, the elevation of blood volume, and blood pressure throughout the body?

- A. Growth hormone
- B. Melanocyte stimulating hormone
- C. Adenocorticotrophic hormone
- D. Antidiuretic hormone

NSLO1a; NSLO2a; NSLO5a

41. Which cell in the blood is responsible for the cell's ability to transport oxygen and carbon dioxide?

- A. lymphocyte
- B. hemoglobin
- C. eosinophil
- D. leukocyte

NSLO3a; NSLO4a

42. Megakaryocytes give rise to _____.

- A. platelets
- B. granulocytes
- C. red blood cells
- D. aganulocytes

NSLO1a; NSLO5a

43. Which type of blood vessel transports blood to the heart?

- A. vein
- B. capillary
- C. artery
- D. arterioles

NSLO5a

44. Which valves of the heart are located on the left side of the heart?

- A. Pulmonary valve and bicuspid valve
- B. Aortic valve and mitral valve
- C. Pulmonary valve and tricuspid valve
- D. Aortic valve and tricuspid valve

NSLO1a; NSLO2a; NSLO5a

45. Which system interacts with other systems and tissues to defend the body against infection and disease?

- A. Lymphoid system
- B. Cardiovascular system
- C. Respiratory system
- D. Integumentary system

NSLO3a; NSLO5a

46. Place the movements of the larynx during swallowing in order from the beginning to the end of the process.

- 1. Laryngeal movement folds the epiglottis, and the pharyngeal muscles push the bolus into the esophagus.
 - 2. The tongue forces compacted bolus into the oropharynx.
 - 3. The bolus moves along the esophagus, and the larynx returns to normal position.
- A. 1,2,3
 - B. 2,1,3
 - C. 2,3,1
 - D. 3,2,1

NSLO1a; NSLO2a; NSLO3a; NSLO4a; NSLO5a

47. The functions of the urinary system include which of the following?

- A. Regulating plasma concentrations of sodium, potassium, chloride, calcium and other ions by controlling the quantities lost in urine
- B. Synthesizing calcitriol
- C. Contributing to the stabilization of blood pH
- D. All of the listed responses are correct.

NSLO5a

48. Which of the following regions comprise(s) the uterine tube?

- A. Infundibulum
- B. Ampulla
- C. Isthmus
- D. All of the responses are correct.

NSLO1a; NSLO3a; NSLO4a; NSLO5a

49. The functional male and female reproductive cells are known as _____.

- A. Gametes
- B. Fertilization
- C. Spermatogenesis
- D. All of the listed responses are correct.

NSLO1a; NSLO3a

50. Which component of the digestive system secretes lubricating fluids containing enzymes that break down carbohydrates?

- A. Salivary glands
- B. Pancreas
- C. Small intestine
- D. Stomach

NSLO1a; NSLO2a; NSLO3a; NSLO5a

HOW WILL THE DEPARTMENT OF BIOLOGICAL SCIENCES USE THE DATA GENERATED BY THIS INSTRUMENT TO PLAN CURRICULAR AND PEDAGOGICAL CHANGES THAT MIGHT BE NECESSARY IN BIOL2443/BIOL2441L?

Analysis of student performance was based on overall performance on the exam, not on the individual questions. Faculty review the exam results annually, including responses on individual questions and will modify some questions for the assessment to better respond to the Natural Science Learning Outcomes. The faculty will discuss the results of the assessment process to identify problem areas in the course that can be addressed through implemented curricular modification including changes to course content or structure, and delivery mechanisms necessary to meet the needs of the target audience and fully address the Natural Science Learning Outcomes.