



SYLLABUS

CATALOG DESCRIPTION

The organization of cells and tissues and their metabolic and homeostatic processes and regulation. Physical and chemical operation of organs and systems of the human body, including the integumentary, skeletal, muscular and nervous systems. Course includes 1 credit hour lab component.

Prerequisites: MATH 095, RDNG 099, and ENGL 099 or appropriate Math, Reading, and English Accuplacer scores.

Semester Offered: Fall, Spring, and Summer

Common Student Learning Outcomes

Upon successful completion of San Juan College programs and degrees, the student will demonstrate competency in...

BROAD AND SPECIALIZED LEARNING

Students will actively and independently acquire, apply, and adapt skills and knowledge with an awareness of global contexts.

CRITICAL THINKING

Students will think analytically and creatively to explore ideas, make connections, draw conclusions and solve problems.

CULTURAL AND CIVIC ENGAGEMENT

Students will act purposefully, reflectively, and ethically in diverse and complex environments.

EFFECTIVE COMMUNICATION

Students will exchange ideas and information with clarity in multiple contexts.

INFORMATION LITERACY

Students will be able to recognize when information is needed and have the ability to locate, evaluate, and use it effectively.

INTEGRATING TECHNOLOGIES

Students will demonstrate fluency in the application and use of technologies in multiple contexts.

Student work from this class may be randomly selected and used anonymously for assessment of course, program, and/or institutional learning outcomes. For more information, please refer to the Dean of the appropriate School.

General Learning Outcomes

Upon successful completion of the course, the student will be able to...

1. Acquire a functional understanding of the relationship between the anatomical structures of the human body and their physiological function.
2. Demonstrate understanding of the interrelationships among the various organ systems and their contribution to the health of the individual.
3. Demonstrate understanding of how knowledge of organ system dysfunction provides a basis for understanding the disease process.

Specific Learning Outcomes

Upon successful completion of the course, the student will be able to...

1. List and recognize the various organizational levels of the human body.
2. Discuss the relationship between anatomy and physiology.
3. Explain the concept of homeostatic regulation as a basis for maintaining health.
4. Diagram and discuss the role of negative and positive feedback as homeostatic mechanisms.
5. Locate the major anatomical directions, regions, planes, cavities and membranes of the human body.
6. List the 11 body systems, their major organs and functions.
7. Review the basic chemical reactions of living things.
8. Review the main classes of organic compounds in the human body.
9. Review cell membrane structure and transmembrane transport systems.
10. Review the basic cell organelles and their function.
11. Review protein synthesis.
12. Name the classes of tissue and relate their cellular composition and arrangement to function.
13. Describe the location and function of serous, mucous, epithelial, and synovial membranes.
14. Describe the tissue response to injury.
15. List the physiological roles of the integumentary system.
16. Compare structure and functional roles of the epidermis, dermis, and hypodermis.
17. Describe the accessory structures and glands of the skin.
18. List the physiological roles of osseous tissue.
19. Explain the differences in function and structure of compact and spongy bone.
20. Describe bone formation, growth, remodeling and repair.
21. Compare the roles and regulation of osteoprogenitor cells, osteocytes, osteoclasts and osteoblasts.
22. Describe the hormones involved in calcium and phosphorus regulation and their effect on bones.
23. Name and locate the major bones of the axial and appendicular skeleton.
24. Define the basic bone terminology including landmark terminology.
25. Know the major landmarks and identifying characteristics of the major bones.
26. Describe the classifications of articulations and indicate examples of each.
27. Name and give examples of the types of joint movements.
28. Describe the arrangements of bones, ligaments, and muscles at the shoulder, elbow, hip, and knee joints.
29. Describe the structure of skeletal muscle tissue and cells.
30. Identify the origin, insertion, and actions of selected skeletal muscles.
31. Define the terms used in naming muscles.
32. Understand the roles of prime mover, antagonist, synergist and fixator muscles.
33. Describe the organization of the sarcomere. Explain the sliding filament mechanism of muscle contraction.
34. Explain the relationship between muscle length and tension in skeletal muscles.
35. Describe the 3 lever systems in the body and give examples of each.
36. Discuss the physiology of gross muscle contraction, including twitch, tetany, isometric and isotonic contractions.
37. Discuss aerobic and anaerobic ATP generation in skeletal muscles.
38. Compare the structure and function of smooth, cardiac, and skeletal muscle tissues.
39. Describe the special characteristics of cardiac and smooth muscle cell anatomy and function/abilities.
40. Describe the organization of the nervous system.
41. List the major cellular components of the nervous system.
42. Describe the roles of anatomical locations of myelinated and unmyelinated neurons.
43. Know the structure and function of the four classes of neuroglial cells.
44. Understand the ionic basis of the resting, graded, and action potential.
45. Describe the action potential in terms of altered membrane permeability and ionic currents.
46. Compare action and local potentials.

47. Describe the effects of altered ion concentrations on excitable membranes.
48. Identify the structural components of a chemical synapse and indicate the sequential occurrence of events during synaptic transmission.
49. Describe the integrative function of chemical synapses in information processing.
50. Name and classify the major neurotransmitters.
51. Locate and name the gross structures of the spinal cord.
52. Diagram the divisions and branches of a spinal nerve.
53. Name the major peripheral nerve plexus. Be able to describe which spinal nerves contribute to each plexus and which major peripheral nerves arise from each plexus.
54. Describe and draw the major components of the reflex arc.
55. Diagram and discuss the role of the stretch, tendon, withdrawal, and crossed-extensor reflex.
56. Locate and name the major regions and anatomical landmarks of the brain.
57. Locate and relate the general physiological roles of the cerebrum, diencephalon, cerebellum, midbrain, pons, and medulla.
58. Describe the roles of the thalamus and hypothalamus.
59. Describe the formation, flow, and reabsorption of cerebral spinal fluid.
60. Locate and name the three meningeal layers covering the brain and spinal cord.
61. Locate, name, and discuss the roles associated with the four major cerebral lobes.
62. Name the cerebral nuclei and describe their role of motor activity.
63. Name the major structures and functions of the limbic system.
64. Locate, name and indicate the major sensory and/or motor function of each cranial nerves.
65. Diagram and discuss the role of the dorsal column and anterolateral sensory tracts.
66. Diagram and discuss the motor function of the major descending motor tracts.
67. Describe the major neural structures associated with memory and consciousness.
68. Compare and contrast the autonomic and somatic motor systems.
69. Compare the general anatomy and functions of the parasympathetic and sympathetic branches of the autonomic nervous system.
70. Identify the major general sensory receptors and the modalities they encode.
71. Locate, name, and describe the function of the external and internal structures of the eye.
72. Describe the roles of the cornea, lens, and ciliary body in focusing an image on the retina.
73. Discuss the process of sensory detection for taste and smell.
74. Describe the physiology of photon detection by rods and cones.
75. Describe the outer, middle, and inner ear structures and their roles in sound transduction.
76. Describe the structures and central pathways associated with the sense of equilibrium.
77. Trace the projection pathway from the peripheral receptors to the cortex for all special sense modalities.