Midland College
Syllabus
Fall 2018
RSPT 1307
Cardiopulmonary Anatomy and Physiology
(3-0-0)

Course Description: An introduction to the anatomy and physiology of the cardiovascular and pulmonary systems.

Text, References, and Supplies:

Textbooks (Required textbook is in bold print)


Students MUST actively participate by completing an academic assignment required by the instructor by the official census date. Students who do not actively participate in an academically-related activity will be reported as never attended and dropped from the course.

Course Goals/Objectives: Upon successful completion of the course the student will:

1. Identify the role of the nervous system in maintaining homeostasis.
2. Classify the organs of the nervous system into central and peripheral divisions.
3. Contrast the histological characteristics and functions of neuroglia and neurons.
4. Classify neurons by shape and function.
5. List necessary conditions for nerve regeneration.
6. Discuss the initiation and conduction of a nervous impulse.
7. Define saltatory conduction.
8. Describe the all-or-none principle of nervous conduction.
9. Discuss the factors that determine the rate of impulse transmission.
10. Define a synapse and describe conduction of an impulse across the synapse.
11. Discuss excitatory transmitter-receptors versus inhibitory transmitter-receptors.
12. Discuss the role of transmitter substances for conduction across the synapse.
13. List factors that may inhibit or block nerve impulses.
15. Briefly discuss the function of principle parts of the brain and brain stem.
16. List the cranial nerves.
Chapter 1

17. Identify the role of the **respiratory system** in maintaining homeostasis.
18. Identify structures of the upper airways
19. Discuss the functions of the upper airways
20. Identify structures of the lower airways
21. Discuss functions of the lower airways
22. Compare and contrast cartilaginous vs. non-cartilaginous airways
23. Identify structures responsible for gas exchange
24. Identify structures which compose the pulmonary vascular system
25. Discuss the function of the pulmonary vascular components
26. Briefly discuss the lymphatic system
27. Discuss neural control of the lungs
28. Identify structures of the lungs
29. Identify structures of the mediastinum
30. Identify structures of the pleurae
31. Discuss the function of the pleurae
32. Identify structures of the thorax
33. Describe the use of respiratory muscles

Chapter 2

34. Describe ventilation
35. Discuss pressure changes associated with breathing
36. Discuss compliance
37. Explain the importance of surface tensions
38. Explain the principles associated with flow through tubes
39. Discuss airway resistance
40. Describe the use of time constants
41. Differentiate between ventilation and dead space
42. Calculate alveolar ventilation
43. Describe various ventilatory patterns

Chapter 3

44. Identify lung volumes and capacities
45. Differentiate between obstructive and restrictive lung disease using PFTs
46. Describe pulmonary mechanics measurements
47. Discuss the use of flow/volume curves
48. Explain dynamic compression
49. Discuss measurements associated with respiratory muscle strength
50. Describe D\textsubscript{L}CO

Chapter 4

51. Discuss diffusion of pulmonary gases
52. State gas laws associated with diffusion of pulmonary gases
53. Identify partial pressures of gases in air, alveoli, and blood
54. Calculate P\textsubscript{A}O\textsubscript{2} using the alveolar air equation
55. Differentiate between perfusion limited and diffusion limited
Chapter 5

56. Identify components of the **circulatory system**
57. Describe the functions of the various components of the circulatory system
58. Describe how blood flows through the heart
59. Explain the neural control of the vascular system
60. Discuss the distribution of blood flow in the lungs
61. Explain cardiac output
62. Discuss pulmonary vascular resistance

Chapter 6

63. Describe oxygen transport
64. Describe carbon dioxide transport

Chapter 7

65. Describe acid/base balance

Chapter 8

66. Discuss ventilation/perfusion relationships

Chapter 9

67. Explain neural control of ventilation

Chapter 10

68. Discuss fetal lung development
69. Describe fetal circulation
70. Discuss cardiopulmonary changes associated with birth

Chapter 11

71. Describe the effects of aging on the respiratory system
72. Describe the effects of aging on the cardiovascular system

Chapter 12

73. Discuss the electrophysiology of the heart

Chapter 13

74. Explain the standard 12-lead ECG system
75. Identify components of an ECG

Chapter 14

76. Interpret various ECGs
Chapter 15

77. Identify direct hemodynamic measurements
78. Identify calculated hemodynamic values
79. Calculate hemodynamic values

Chapter 16

80. Identify structures of the renal system
81. Discuss urine formation
82. Explain the significance of urine volume and concentration
83. Describe regulation of electrolytes
84. Discuss the role of the kidney in acid/base balance and blood volume
85. Explain renal failure
86. Relate cardiopulmonary disorders associated with renal failure

Chapter 17

87. Discuss sleep physiology and its association with the cardiopulmonary system

Chapter 18

88. Discuss the effects of exercise on the cardiopulmonary system

Chapter 19

89. Discuss high altitude effects on the cardiopulmonary system

Chapter 20

90. Discuss high pressure environments effects on the cardiopulmonary system

Enrichment

91. Explain nerve, heart, lung, kidney interrelationship
92. Explain fluid electrolyte significance
93. Demonstrate physical assessment technique

Student Contributions

Each student will spend at least 6 hours per week preparing for class. Attendance is critical in this class. The college attendance policy will be followed.

Class Policies:

All classroom performance and behavior will be considered academic.
Evaluation of Students: A minimum of four (4) tests will be given including a comprehensive final (unless otherwise designated by the instructor). The final exam will carry the same weight as other exams (not quizzes). Weekly quizzes will be averaged and will equal one exam. Test questions will come from lecture, reading assignments and homework assignments. Most tests will be objective in nature.

1. Tests (minimum of four)
   A. term project required  80%
   B. if term project not required  90%

2. Attendance, participation and attitude  10%

3. Term project or paper if required  10%

   Total  100%

Course Schedule: The class meets for 3 lecture hours per week. 1 1/2 hours each on Tuesday/Thursday from 1:30 to 3:00 PM.

Students with Disabilities: Midland College provides services for students with disabilities through Student Services. In order to receive accommodations, students must place documentation on file with the Counselor/Disability Specialist. Students with disabilities should notify Midland College prior to the beginning of each semester. Student Services will provide each student with a letter outlining any reasonable accommodations. The student must present the letter to the instructor at the beginning of the semester.

Instructor's Information: Name: Robert Weidmann, M.Ed., RPFT, RRT-NPS, RCP
Office Location: A34 AMS
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Home Telephone: 432/697-4725
E-Mail Address: rweidmann@midland.edu
Office Hours: *Mon/Fri  8-10:30
            Tues/Thur 8-10:30; 3-4:30
            Wed  1-3
            *at clinical site
Division Dean:    Dr. Carmen Edwards, Ed.D., MSN, RN
Division Secretary: Karen Harris
Division Office Location and Telephone: 208 DHS, 685-4600

Students are encouraged to contact the instructor at any time; however, making an appointment will guarantee the instructor’s availability at a specific time.

Revised: 8/18
Licensure Eligibility Notification

Completion of Midland College degrees and/or certificates does not guarantee eligibility to take a certification/registry/licensure examination. The eligibility of each person is determined on an individual basis by the regulatory body of the specific discipline. If you have a conviction of a crime other than a minor traffic violation, physical or mental disability/illness, hospitalization/treatment for chemical dependency within the past five years, current intemperate use of drugs or alcohol or a previous denial of a licensure or action by a licensing authority, you will need to contact the specific regulatory body for an individual ruling. Some programs require a criminal background check and urine and drug screen.

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Spanish
Midland College no discrimina por motivos de raza, color, nacionalidad, sexo, discapacidad, o edad en sus programas o actividades. Las siguientes personas han sido designadas para responder a cualquier pregunta o duda sobre estas políticas no discriminatorias: Tana Baker, Title IX Coordinator/Compliance Officer, 3600 N. Garfield, SSC 242, Midland, TX 79705, (432) 685-4781, tbaker@midland.edu; Natasha Morgan, Director Human Resources/Payroll, 3600 N. Garfield, PAD 104, Midland, TX 79705, (432) 685-4534, nmorgan@midland.edu. Para más información sobre estas políticas no discriminatorias, visite http://wdcrobcolp01.ed.gov/CFAPPS/OCR/contactus.cfm o llame al 1 (800) 421-3481.
RSPT 1307  Cardiopulmonary/Renal Anatomy and Physiology

The above named course syllabus and licensure eligibility notification have been received by, and explained to me. I have read, understand, and will adhere to the same.

Student's signature

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This sheet must be returned to your instructor by the end of the first week of class.