

Course Title: MOD1-BIO155G -Anatomy and Physiology**Credits: 4.00**

Course Description: A thorough survey of human Anatomy and Physiology, including proper identification of body planes and sections along with their identifying landmarks; the structure and function of all major organ systems; and an introduction to basic biochemistry, including organic elements and compounds, cell structure, metabolism, and division, semi-permeable membranes, electrolytes, and enzymes.

Learning Objectives:

- A: Students will be able to answer the Study Questions (below).
 B: Student will be able to demonstrate thorough knowledge of the Clinical Skills required for this course (below).
 C: Student will demonstrate thorough knowledge of the MANA Core Competencies for Midwives required for this course (below).
 D: Students will be able to demonstrate knowledge of any new information in the area of study.

Learning Activities:

- I. Student Reads required texts.
- II. Student Completes study questions.
- III. Preceptor elaborates on study questions.
- IV. Clinical Skills and Core Competencies training consists of the following (may take place at clinical visits):

1. Preceptor Explanation of	Safe, evidence-based midwifery care for the individual Clinical Skills and Core Competencies including etiology, sequelae, appropriate management and follow-up for the individual patient, appropriate times and reasons for consult and referral, access to relevant resources and information, complete, thorough and timely record keeping, appropriate, professional, and compassionate management of every task involved, receptiveness and responsiveness to patient's concerns. The Explanation will include a discussion of midwifery decisions and actions as they relate to possible outcomes and their wider impact, based on the Midwives Model of Care®.
2. Preceptor Demonstration of	
3. Student Practice of	
4. Student Demonstration of	

V. Student researches and presents to the preceptor relevant latest developments in academic and clinical midwifery.

VI. Student/Preceptor discussion.

Learning Materials / Resources:

(Please use textbooks less than 5 years old, or most recent edition)

1. Marieb, Elaine N., and Hoehn, Katjan. Anatomy and Physiology. Addison-Wesley Longman Inc. 2008.
2. Weaver, Pam and Evans, Sharon K. Practical Skills Guide for Midwifery, 4th Edition. Morningstar Publishing Co. Wasilla. 2007.
3. MEAC Abbreviated NARM Skills Form.
4. MANA Core Competencies for Midwives
5. Midwives Model of Care®.
6. Internet links as needed for latest developments in midwifery care:
[The Cochrane Collaboration](#)
[EBSCO](#)
[National Library of Medicine](#)
[PubMed](#)
[Medline](#)
[SCIRUS](#)
[Medscape](#)
[World Health Organization](#)

Evaluation Tools / Methods:

1. Answers to study questions: Student must achieve at least 80% correct to pass. The preceptor evaluates each answer for correctness and explains the questions that were incorrect. This counts for 85% of the final grade.
2. Clinical Skills: Student must demonstrate thorough knowledge of each skill. This counts for 5% of the final grade. *Academic courses CAN be completed without the student achieving "mastery" of each skill*, however the skills on the MEAC Abbreviated NARM Skills Form (which is a separate requirement) are not filled in until the student achieves Mastery* of the skill.
3. MANA Core Competencies: Student's ability to apply MANA Core Competencies for Midwives in discussion to simulated and real-life situations. This counts for 5% of the final grade.

Evaluation of NARM Skills and MANA Core Competencies: The student demonstrates thorough knowledge to the satisfaction of the preceptor in the following areas:

The student will be able to, in accordance with safe, evidence-based midwifery care, explain the condition, verbalize etiology and sequelae, verbalize appropriate management for the individual patient, follow up appropriately, consult and refer appropriately, access resources and information, accomplish complete, thorough and timely record keeping, appropriately manage every task involved correctly, professionally, and compassionately, while being receptive and responsive to patient's concerns. She/he will be able to explain her decisions and actions as they relate to possible outcomes and their wider impact.

4. Student presentation of new information in area of study. The preceptor evaluates the correctness of the information presented. This counts for 5% of the grade.

Study Questions

1. List the ten organ systems of the body, briefly describe the functions of each, and name two organs of each system.
2. Explain the difference between anatomy and physiology.
3. What five items are essential to maintain life?
4. Define homeostasis.
5. Explain homeostatic control mechanisms. (Draw a diagram if needed.)
6. Describe homeostatic imbalance.
7. Explain anatomical position.
8. Define the following orientation and directional terms:
 - a. superior
 - b. inferior
 - c. anterior (ventral)
 - d. posterior (dorsal)
 - e. medial
 - f. lateral
 - g. intermediate
 - h. proximal
 - i. distal
 - j. superficial
 - k. deep
9. Describe the four body planes and section
10. Define surface anatomy.
11. Describe the following landmarks:

Anterior landmarks

- a. abdominal
- b. antecubital
- c. axillary
- d. brachial
- e. buccal
- f. cervical
- g. digital
- h. femoral
- i. inguinal
- j. oral
- k. orbital
- l. patellar
- m. pubic
- n. thoracic
- o. umbilical

Posterior landmarks

- p. deltoid
- q. gluteal
- r. lumbar
- s. occipital
- t. popliteal
- u. scapular
- v. sural

12. Describe the location of the flank.

13. What are the two sets of internal cavities and their subdivisions?

14. Describe which organs are found in both subdivisions of the ventral body cavity.

15. Explain which organs are found in the thoracic cavity only.

16. Explain which organs are in the abdominopelvic cavity only.

17. Explain the function of the serous membrane lining the ventral body cavity and covering its organs.

18. A woman at 12 weeks gestation is complaining of pain in her epigastric, umbilical, and hypogastric regions. What areas are painful?

19. A woman arrives for her routine antibody screen, diabetes screen and hematocrit level check at 28 weeks gestation. You explain that you need blood from her antecubital and digital regions. What parts of the body will you draw

blood from? As she leaves the center you notice she has bruising on her patellar and popliteal regions. What parts of her body are bruised?

20. Define energy.

21. Identify the energy form in use in each of the following examples:

- a. Dancing
- b. Breaking the bonds of ATP molecules to energize your muscle cells to bend your leg
- c. Chewing food
- d. Ultrasound
- e. Static shock from the carpet

22. Name the four elements making up the bulk of living matter and list 3 trace elements.

23. What is the relationship of an atom to an element?

24. Explain why all atoms are neutral.

25. Describe the relationship of protons, neutrons and electrons.

26. How is an element identified?

27. What is a molecule?

28. Define valence shell and its significance.

29. Name two types of compounds that are essential to the human body.

30. Explain why water is important to the body.

31. Define electrolyte.

32. What is the pH of blood?

33. Define amino acid.

34. Define enzyme and describe the mechanism of enzyme activity.

35. Describe the specific function of DNA found in the nucleus of the cell.

36. What is the major function of RNA?

37. Describe the three different types of RNA.

38. Explain the value of ATP to the body.

39. Describe the functions of the cell nucleus, cytoplasm, and organelles.
40. Explain the importance of mitotic cell division.
41. Give the locations of the various tissue types in the body.
42. Define:
- a. selective permeability
 - b. diffusion including dialysis and osmosis
 - c. active transport
 - d. permease system
 - e. phagocytosis
 - f. pinocytosis
 - g. hypertonic
 - h. hypotonic
 - i. isotonic
43. Define hydrolysis.
44. List the functions of mitochondria.
45. List the most important functions of epithelial tissues and give examples of each.
46. Describe the functions of connective tissue.
47. Define muscle fatigue and give at least four factors which may contribute to this.
48. Explain what is meant by "smooth muscles are involuntary in action".
49. Explain the ways neurons are similar to other cells. Describe how they are different.
50. Define:
- a. neoplasm
 - b. atrophy
 - c. hyperplasia
51. Explain which primary tissues are destroyed when the skin is damaged.
52. Define cyanosis. Explain what its presence indicate.
53. Explain how the skin helps regulate body temperature.
54. Describe the connective tissue membrane found lining joint cavities.

55. Name three changes that occur in the skin as one ages.
56. Name three functions of the skeletal system.
57. Name the four major classifications of bone and give two examples of each. Why do bone injuries heal much more rapidly than injuries to cartilage?
58. Name two ways in which the fetal skull differs from the adult skull.
59. Name the five major regions of the vertebral column.
60. The major function of the shoulder girdle is flexibility. Explain the major function of the pelvic girdle.
61. List three differences between the male and female pelvis.
62. List two factors that keep bones healthy and two factors that can cause bones to become soft or atrophy.
63. Compare skeletal, smooth, and cardiac muscles as to their microscopic anatomy, location, arrangement in body organs, and their functions in the body.
64. Describe the function of tendons.
65. Explain how isotonic and isometric contractions differ.
66. Describe muscle tone and its importance.
67. Describe a prime mover and how it is different from a synergist muscle.
68. Other than acting to flex the spine and compress the abdominal contents, the abdominal muscles are extremely important in protecting and containing the abdominal viscera. Describe what it is about the arrangement of these muscles that makes them so well suited for their job.
69. Name the two great controlling systems of the body.
70. Name at least five functions performed by the cerebral hemispheres.
71. Describe the function of the:
 - a. thalamus
 - b. hypothalamus
 - c. cerebellum
72. Explain the two functions of the spinal cord.

73. How many pairs of spinal nerves are there?
74. Explain how the autonomic nervous system differs from the somatic nervous system.
75. Describe the difference in function of the parasympathetic and sympathetic divisions of the autonomic nervous system.
76. Define the blind spot and explain why it is called this.
77. Describe the difference between the functions of rods and cones.
78. Define hyperopia, myopia and emmetropia.
79. Explain why the ophthalmic examination is important.
80. When a light is shone into one eye, the pupil constricts. Explain the importance of this reflex.
81. Explain the difference between sensorineural deafness and conduction deafness and list one cause of each.
82. Name the taste receptors and their locations.
83. Name the four primary taste sensations.
84. There are two general types of glands in the body. Explain how the endocrine and exocrine glands differ in their products and in the way their products reach their final destinations.
85. Define hormone.
86. Describe the body location for each of the following endocrine organs, the hormone each produces, and its effect on body processes:
- | | |
|-----------------------|-------------|
| a. anterior pituitary | d. pancreas |
| b. pineal gland | e. ovaries |
| c. thymus | f. testes |
87. Two hormones are closely involved in the regulation of the fluid and electrolyte balance of the body. Name them and explain their effects on their common target organ.
88. What is the blood volume of an average-size adult?
89. Define anemia. Give three possible causes of anemia.

90. Explain why an Rh- person does not have a transfusion reaction on the first exposure to Rh+ blood. Why is there a transfusion reaction the second time she receives the Rh+ blood?
91. Name the four ABO blood groups. Which is the most common? Which is the least common?
92. If you had a severe infection, would you expect your WBC count to be closest to 5,000, 10,000 or 15,000/mm³? Why? Name this condition.
93. Trace one drop of blood from the time it enters the right atrium of the heart until it enters the left atrium of the heart. What name is given to this circuit?
94. Explain why a thrombus in a coronary artery might cause sudden death.
95. Define systole, diastole, and cardiac cycle.
96. Describe the differences between arteries and veins and the reasons for these differences.
97. Name the factors that are important in promoting venous return.
98. The liver and lungs are nearly entirely by-passed in the fetus. Why is this? Name the vessel that bypasses the liver. Name two lung bypasses. Three vessels travel in the umbilical cord. Which carries oxygen and nutrient-rich blood?
99. Define pulse.
100. Explain the vital role that blood pressure plays.
101. Explain the effect of hemorrhage on blood pressure and give your reasoning. In which position--sitting, lying down, or standing-- is blood pressure normally the highest? The lowest?
102. Define immune response.
103. Define antigen.
104. Explain how antibodies help defend the body.
105. Describe the events that can result in the loss of self-tolerance or autoimmune disease.
106. Describe the basic function of respiration.

107. In terms of general health, explain the importance of the fact that the eustachian tubes and the sinuses drain into the nasal cavities and nasopharynx.
108. Describe what normally causes air to flow out of the lungs during expiration.
109. Explain the major way oxygen is transported in the blood.
110. Name the two major brain areas involved in the nervous control of breathing.
111. Define hyperventilation. If you hyperventilate, do you retain or expel more carbon dioxide? What effect does hyperventilation have on blood pH?
112. Name two functions of saliva.
113. What is the normal number of permanent teeth? Of deciduous teeth?
114. Name two regions of the digestive tract where mechanical food breakdown occurs and explain how it is accomplished in those regions.
115. Explain why it is necessary for the stomach contents to be so acidic. Describe how the stomach protects itself from digestion.
116. Only one organ produces enzymes capable of digesting all groups of foodstuffs. Name this organ.
117. Explain why fatty stools result from the absence of bile and/or pancreatic juice.
118. Name the organ where most nutrient absorption occurs.
119. Name the substances that are absorbed in the large intestine.
120. Define metabolism, anabolism, and catabolism.
121. Name the food group which is most important as a fuel source (that is for catabolism and ATP production). Name the food group which is most important for building cell structures.
122. Name the location of the body's thermostat.
123. Define fever. Name some possible indications of fever.
124. Describe the location of the kidneys in the body.
125. Name the structural and functional units of the kidney.

126. Besides ridding the body of wastes formed during cell metabolism, the kidney continually adjusts blood chemistry in other ways. Describe these three other ways.
127. Name three substances normally found in blood that are not normally found in urine. Give the name of the condition when each of the named substances is found in urine.
128. Describe the differences in structure and function of the male and female urethras.
129. Explain why cystitis is more common in females than males.
130. Name the primary sex organs, or gonads, of males. Describe their two major functions.
131. Describe the function of seminal fluid.
132. Explain how enlargement of the prostate gland interferes with a male's reproductive function.
133. Name the female gonads and list two of their major functions.
134. Name the structures of the female duct system and describe the important functions of each.
135. Name the anterior pituitary hormones that cause follicle development and ovulation to occur. Define follicle. Define and describe ovulation.
136. The female cell that is ovulated is not a mature ovum. Explain under what conditions it becomes mature.
137. Name the "feminizing" hormone. Describe its production. Name the second hormone produced by the ovary.
138. List and describe the events of the menstrual cycle. Describe the importance of the menstrual cycle.
139. Define menopause. Explain what this means to a female.
140. Explain the role of the mammary glands.
141. Define fertilization. Explain where fertilization usually occurs. Describe the process of implantation.
142. List the hormones produced by the placenta and their functions.

143. Describe the ways in which the functioning of the pregnant woman's body is changed by pregnancy.
144. Name the four elements that make up the bulk of all living matter. Provide both their names and their atomic symbols.
145. List at least six other elements found in the body and describe one way in which each is important to body functioning.
146. Salts, acids and bases are electrolytes. Define electrolyte.
147. Explain what distinguishes salts, acids, and bases from each other.
148. State which of the following is acidic, which is basic, and which is neutral: pure (distilled) water, vinegar, sodium bicarbonate, gastric juice.
149. Define pH and its ranges. What is the normal range of blood pH? This is slightly _____ (acidic? basic?).
150. Name the two protein classes based on structure and function in the body, and give two examples of each.
151. Define enzyme and describe the mechanism of enzyme activity.
152. What is the relationship of enzymes to metabolic disorders (such as phenylketonuria)?

Clinical Skills (NARM Skills)

No clinical skills required for this course.

Core Competencies (MANA Core Competencies for Midwives)

II. General Knowledge and Skills

The midwife provides care incorporating certain concepts, skills and knowledge from a variety of health and social sciences including, but not limited to:

2 B. Human anatomy and physiology relevant to childbearing

III. Care During Pregnancy

The midwife provides health care, support, and information to women throughout pregnancy. She determines the need for consultation or referral as appropriate. The midwife uses a foundation of knowledge and/or skill which includes the following:

3 K. Anatomy, physiology and evaluation of the soft and bony structures of the pelvis.