Course Title: Anatomy and Physiology
Credits: 4.0

Course Description: This course provides a thorough survey of human anatomy and physiology, including proper identification of body planes and sections along with the structure and function of all major organ systems. This course includes an introduction to basic histology including cell structure, metabolism, and division, semi-permeable membranes, and enzymes.

NARM Skills
No clinical skills required for this course.

Learning Activities:

A. Student reads appropriate sections from the Learning Materials/Resources.

B. Student answers the questions listed in the Learning Objectives by researching the Learning Materials/Resources for the course and correctly cites the sources and page numbers for each of their answers.

C. Student presents answers the questions listed in the Learning Objectives for review by preceptor.

D. Student participates in preceptor elaboration/discussion of Learning Objectives.

E. In the case that the required texts are more than 5 years old, the student must research, prepare & present a summary of current best midwifery care/practices appropriate to a topic covered in this course from a current journal article/study, less than 5 years old.

F. Recommended Role-playing and/or Clinical Interactions
   Note: The clinical requirement of NARM /Clinical Skills is completed at any time throughout the ASM apprenticeship during actual clinical practice and is NOT a requirement to complete this academic course.

   Activities specific to NARM skills learned in this section:

   2. Point out on another student or preceptors all the planes of the body.
   3. Draw the muscles of the pelvic floor and label them.
   4. Draw the female reproductive system structures and label them.
   5. Visit a cadaver lab with a student that can point out structures that have been dissected.

Learning Materials / Resources:

Please use textbooks less than 5 years old or most recent edition.


7. Students must find 1 article/study less than 5 years old. Recommended internet links as needed for latest developments in midwifery care: [https://www.midwiferycollege.edu/resources-national-college-of-midwieri](https://www.midwiferycollege.edu/resources-national-college-of-midwieri)

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**Evaluation Tools / Methods:**

*Minimum passing grade for each course is a cumulative 80% / B-. Students and preceptors are encouraged to work together until the student masters the information.*

Final grade for the course is based on preceptor evaluation of the following:

A. Learning Objectives count for 50% of the final grade.
   The preceptor evaluates each answer based on three elements:

   1. Answers should reflect a thorough review of current literature regarding best current practices in midwifery care.
   2. Each answer should be formed in the student's own words or paraphrased from the text. The answer should be minimal, not a re-write of the entire text, but enough to show appropriate comprehension of the learning objective.
   3. Student identification of sources and page numbers for each of the Learning Objectives. (Preceptor should do a random check to determine that sources cited are correctly identified.)

B. Enrichment Activities, including research essays and summaries of articles: 20%
C. Discussions: 15%
D. Tests and Exams: 15%

Course credit:
One Academic credit equals approximately 15 hours of formal time plus 30 hours of additional study or homework. Formal time is defined as the amount of time taken to answer the Learning Objectives to the level of 80% and to complete any learning activities to the preceptor’s satisfaction, including any time spent face to face with the preceptor. Informal time includes any time spent actively reading relevant sources and textbook/s, researching Learning Objectives, and studying for examinations.

Learning Objectives:

A. The student must research, prepare & present a summary of an aspect of current best midwifery care/practices appropriate a topic from this course from a current journal article/study.

B. Student answers the questions below and cites the sources and page numbers.

Introduction and Histology

1. Explain the difference between anatomy and physiology.
2. List the ten organ systems of the body,
3. Briefly describe the functions of each of the ten organ systems.
4. What five items are essential to maintain life?
5. Define homeostasis.
6. Give an example of a homeostatic control mechanism. (Draw a diagram if needed.)
7. Describe homeostatic imbalance.
8. Explain anatomical position.
9. What is the smallest functional unit in the body?
10. Describe the function of the cell nucleus.
11. Describe the function of the cell membrane.
12. Describe the function of the cytoplasm.
13. Describe the function of the mitochondria
14. Describe the function of the golgi apparatus.
15. Describe the function of the endoplasmic reticulum.
16. Describe the function of a ribosome.
17. Describe the function of a lysosome or peroxisome.

18. Explain the importance of mitotic cell division.

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

20. What is the major function of RNA?

21. Describe the “active” process by which the cell can exchange substances.

22. Describe the “passive” process by which the cell can exchange substances.

23. Explain the value of ATP to the body.

24. Briefly describe how the body converts glucose into ATP.

25. Briefly describe how a lack of oxygen affects the body’s ability to convert glucose to ATP.

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

Define the following orientation and directional terms:

27. Superior

28. Inferior

29. Anterior (ventral)

30. Posterior (dorsal)

31. Medial

32. Lateral

33. Proximal

34. Distal

35. Superficial

36. Deep

37. Describe the four body planes and section

38. Name the four body cavities.
39. Name the 9 regions that subdivide the abdominal cavity.

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

41. 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?

42. Name the four main types of tissue that make up the body.

43. List the most important functions of epithelial tissues and give examples of each.

44. Give 5 examples of connective tissue.

45. Describe the functions of adipose tissue.

46. Describe the function of cartilage.

47. Describe the function of elastic tissue.

48. Describe the function of areolar tissue.

The Nervous System

49. Explain the ways neurons are similar to other cells.

50. Describe how neurons are different from other cells.

51. Name the structures of the central nervous system.

52. Name the structures of the peripheral nervous system.

53. Briefly describe the difference between the autonomic and somatic nervous system.

54. Briefly describe the functions governed by the sympathetic nervous system.

55. Briefly describe the functions governed by the parasympathetic nervous system.

56. What structures make up the forebrain?

57. What is the general function of the forebrain?

58. What structures make up the brain stem?

59. What is the general function of the brain stem?

60. Explain functions of the spinal cord.
61. Briefly describe how a nerve impulse is conducted.

62. Define a neurotransmitter.

63. Briefly describe the function of cerebrospinal fluid.

64. Briefly describe the physiologic mechanism that allows for sight.

65. Describe the difference between the functions of rods and cones.

66. When a light is shone into one eye, the pupil constricts. Explain the importance of this reflex.

67. What structures make up the inner ear?

68. What structures make up the middle ear?

69. What structures make up the outer ear?

70. Briefly describe the physiologic mechanism that allows for hearing.

71. Briefly describe the physiologic mechanism that allows for balance.

72. Name the taste receptors and their locations.

73. Name the four primary taste sensations.

74. Briefly describe how olfactory sense is conducted to the brain.

75. Give an example of two types of touch receptors.

Musculoskeletal System

76. Name three functions of the skeletal system.

77. Name the four major classifications of bone.

78. Why do bone injuries heal much more rapidly than injuries to cartilage?

79. What are the three types of joints?

80. Name two ways in which the fetal skull differs from the adult skull.

81. Name the five major regions of the vertebral column.

82. The major function of the shoulder girdle is flexibility. Explain the major function of the pelvic girdle.
83. List three differences between the male and female pelves.

84. List two factors that keep bones healthy.

85. Name three types of muscle.

86. Describe the functions of skeletal muscle and where it is found.

87. Describe the function of smooth muscle and where it is found.

88. Describe the function of cardiac muscle and where it is found.

89. Describe the function of tendons.

90. Describe muscle tone and its importance.

**Endocrine System**

91. Explain how the endocrine and exocrine glands differ in their products and in the way their products reach their final destinations.

92. Briefly describe why the endocrine system is so important in conducting the functions of the human body.

93. Define hormone.

94. Describe how the hypothalamus links the brain and the endocrine system.

95. Where is the pituitary gland located?

96. What hormones are produced by the pituitary gland?

97. Where is the pineal gland located and what does it secrete?

98. List the hormones secreted by the thyroid.

99. What is the function of the thyroid hormones?

100. What is the function of parathyroid hormone?

101. What is the function of the thymus gland?

102. What hormones are secreted by the adrenal glands?

103. How does the pancreas function as an endocrine gland?

104. What substances does the islet of langerhans cells secrete?
Cardiovascular system

105. What is the blood volume of an average-size adult?
106. Name the four ABO blood groups.
107. Which is the most common blood type?
108. What is rhesus factor?
109. Define plasma.
110. What are the 3 main types of blood cells?
111. What is the function of an erythrocyte?
112. What is the function of a leukocyte?
113. What is the function of a thrombocyte?
114. Name the chambers and valves of the heart.
115. Which part of the heart is referred to as the pacemaker and why?
116. 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.
117. Define systole.
118. Define diastole.
119. Define cardiac cycle.
120. Define pulse.
121. Explain the vital role that blood pressure plays in function of the human body.
122. Describe the differences between arteries and veins and the reasons for these differences.
123. What is the function of capillaries?
124. Name the factors that are important in promoting venous return.
125. The liver and lungs are nearly entirely by-passed in the fetus. Why is this?
126. Name two lung bypasses in the fetal circulatory system.
127. Name the vessel that bypasses the liver.

128. Three vessels travel in the umbilical cord. Which carries oxygen and nutrient-rich blood?

**Immune System**

129. Describe the function of the lymph system.

130. What are the major structures of the lymph system?

131. Define antigen.

132. Explain what is meant by cell-mediated immunity.

133. Explain what is meant by humoral immunity.

134. Explain how antibodies help defend the body.

135. Define non-specific or innate immunity.

136. What type of immune reaction is a fever?

137. Describe the events that can result in the loss of self-tolerance or autoimmune disease.

**Respiratory System**

138. Describe the basic function of respiration.

139. Name the structures that air passes through before arriving at the lungs.

140. What is the function of the pleural membrane?

141. What are alveoli?

142. Describe the function of alveoli.

143. What is the role of the diaphragm in breathing?

144. Describe the major events of ventilation.

145. Describe what normally causes air to flow out of the lungs during expiration.

146. Explain the major way oxygen is transported in the blood.

147. Name the two major brain areas involved in the nervous control of breathing.
148. Define hyperventilation.

**Digestive System**

149. Name two functions of saliva.

150. Describe the function of the tongue in digestion.

151. What is the normal number of permanent teeth?

152. Explain peristalsis.

153. What are the three regions of the small intestine?

154. Name two regions of the digestive tract where mechanical food breakdown occurs.

155. Explain why it is necessary for the stomach contents to be so acidic.

156. Describe the function of the liver in digestion.

157. Explain the function of bile and pancreatic enzymes.

158. Name the organ where most nutrient absorption occurs.

159. Name the substances that are absorbed in the large intestine.

160. Name the food group which is most important as a fuel source.

161. Name the food group which is most important for building cell structures.

**Renal System**

162. Describe the location of the kidneys in the body.

163. Name the structures of the renal system.

164. Besides ridding the body of wastes formed during cell metabolism, the kidney continually adjusts blood chemistry in other ways. Give an example of this.

165. Name the three main areas of the kidney.

166. Describe the structures of the nephron.

167. Describe the major steps in glomerular filtration.

168. Describe the major steps in selective tubular reabsorption.
169. Describe the major steps in tubular secretion.

170. Describe the function of the ureters.

171. Describe the function of the bladder.

172. Describe the function of the urethra.

173. Describe the differences in structure of the male and female urethras.

Male Reproductive system

174. What structures comprise the external genitalia of males?

175. Name the primary sex organs, or gonads, of males.

176. Describe the function of the seminiferous tubules.

177. Describe the function of the epididymis.

178. Describe the function of seminal fluid.

179. Describe the function of the seminal vesicles.

180. Describe the function of the prostate gland.

181. Describe the function of the bulbourethral glands.

182. Describe the main structures of the penis.

183. What effect does luteinizing hormone have on the male reproductive system?

184. When do males usually go through puberty?

185. What hormonal changes are characteristic of a transition into puberty?

186. What physiologic and anatomical changes are characteristic of a transition into puberty?

187. Briefly describe the structure of mature spermatozoa.

188. Briefly describe the stages of spermatogenesis.

Female Reproductive System

189. Name the structures of the external female genitalia.
190. Describe the function of the labia.
191. Describe the function of the clitoris.
192. Describe the function of the Bartholin glands.
193. What group of nerves supplies nervous function to the external genitalia?
194. Describe the structure of the vagina.
195. Describe the function of the vagina.
196. Describe the layers of tissue that make up the vagina.
197. Name the muscles that make up the “pelvic floor”.
198. Describe the overall function of the pelvic floor musculature.
199. What are the main sections of the uterus called?
200. Name the three layers of tissue that make up the uterine wall.
201. Describe the function of the endometrium.
202. Describe the function of the myometrium.
203. Describe the function of the perimetrium.
204. Describe the function of the cervix.
205. Name the ligaments that hold the uterus and cervix in place.
206. What structures supply the uterus with blood?
207. Describe the structure of the uterine (Fallopian) tubes.
208. Describe the function of the uterine (Fallopian) tubes.
209. Name the female gonads.
210. Describe the structure and location of the ovaries.
211. Describe how the ovaries are supplied with blood.
212. Define follicle.
213. How many primitive follicles does a female child usually have at birth?
214. Define oogenesis.


216. Briefly describe how a primitive or primordial follicle is converted to a secondary oocyte.

217. What is the effect of Follicle Stimulating Hormone (FSH) on the ovary?

218. What is the effect of Luteinizing Hormone (LH) on the follicle?

219. Briefly describe how a secondary oocyte becomes a mature ovum.

220. Define the follicular phase of the ovarian cycle.

221. Define the luteal phase of the ovarian cycle.

222. Name the "feminizing" hormone produced by the ovary.

223. Describe the production of estrogen.

224. Name the second hormone produced by the ovary.

225. List the stages of the menstrual cycle.

226. Briefly describe the events of the menstruation stage.

227. Briefly describe the events of the proliferation stage.

228. Briefly describe the event of the secretion stage.

229. Define menarche.

230. What hormonal changes usually characterize menarche?

231. What physiologic and anatomical changes usually characterize menarche?

232. Define menopause.

233. When does the onset of menopause usually occur?

234. How long does the transition into menopause usually last?

235. Briefly describe the hormonal changes that usually characterize menopause.

236. Briefly describe the physiologic changes that usually characterize menopause.

237. Explain the role of the mammary glands, if any, in female reproductive function.