

**Anatomy Booklet for
BSC 251 LABORATORY STUDENTS
LABORATORY RULES TO FOLLOW:**

1. NO laboratory materials may be removed from WSB 209 (Anatomy) or WSB 224 (Physiology) Labs.
2. If an emergency arises which means missing a lab, contact the Laboratory Coordinator in WSB 136 or call 266-4927 or e-mail her at Patricia.Mcree@usm.edu. See your syllabus for procedures concerning missed laboratories.
3. The laboratories will not be open at any time other than during the regular scheduled times. If you wish to study the laboratory materials, do so during your scheduled lab. Occasionally, before a laboratory practical we will set up open labs. Open labs dates and times will be posted on the lab doors and at the Lab Coordinator's office.
4. Bring both your text and appropriate laboratory manual to each lab. They are needed to study the required materials.
5. No food; drinks or tobacco of any form allowed in the labs and shoes must be worn at all times.
6. Laboratory safety procedures must be followed at all times. This is for both your safety and the safety of other students in the laboratory. No cell phones, pagers, or visitors are to be on in the lab.
7. An Anatomy Booklet is located in the front of your lab manual. A copy of the anatomy booklet can also be found on the following website: <http://www.usm.edu/biologylabs>. This booklet covers everything you are responsible for in the anatomy section of your lab. This site also includes photographs of many of your anatomy lab models.
8. Labs are two hours -- expect to remain in the lab the full time. If you leave an anatomy lab before the period is over, you are to sign-out and note time left. Roll will be taken in every lab. You are welcome to attend another Anatomy lab session if the Teaching Assistant agrees and has room. **Note:** this does not include the lab practicals or physiology labs. Contact the Lab Coordinator about attending one of these labs.

LECTURE TEXT: (Required)

Seeley, Rod R., Trent D. Stephens & Philip Tate. 2008.
Anatomy & Physiology. Eighth edition.
McGraw Hill, New York, New York, 1116 pp.

LABORATORY TEXT: (Required)

Martini, Frederic H. and Roberta M. Meechan. 2001.
Laboratory Manual-Fundamentals of Anatomy and Physiology II.
Prentice Hall, Upper Saddle River, New Jersey, 224 pp.

Laboratory Section: _____

Laboratory Assistant: _____

Period: _____

EXERCISES 27, 28, 30, 33 AND 34 NERVOUS SYSTEM

BRAIN

Cerebrum

frontal lobe 601
parietal lobe 602
occipital lobe 604
temporal lobe 603
precentral gyrus 622
postcentral gyrus 623
central sulcus (fissure of Rolando) 624
lateral ventricle (1st & 2nd ventricles) 612
lateral sulcus (fissure of Sylvius) 621
cerebral cortex (gray matter) 633
white matter 634 (Text 446)
corpus callosum 613

Cerebellum 605

Brain Stem

medulla oblongata 606
pons 608

SPINAL CORD

anterior gray horn(ventral horn) 1
posterior gray horn(dorsal horn) 2
lateral gray horn (lateral horn) 3
central canal 4
dorsal root 8
ventral root 9
spinal nerve 15
dorsal root ganglion (spinal ganglion) 14

NERVES ON CHART, MANNIKIN (NNN) AND LAB MANUAL PAGE 50: FIGURE 33-1(b)(CRANIAL NERVE DIAGRAM): TEXTBOOK PAGE 463: FIGURE 13-15 (CRANIAL NERVE DIAGRAM)

| | |
|---|------------------------|
| *Olfactory bulb & nerve (644) | 33 Median nerve |
| *Optic nerve (2nd CN)(645) | 34 Ulnar nerve |
| *Oculomotor nerve (3rd CN)(646) | 37 Radial nerve |
| *Trochlear nerve (4th CN)(647) | 56 Femoral nerve (685) |
| *Trigeminal nerve (5th CN)(648) | 57 Sciatic nerve (690) |
| *Abducens nerve (6th CN)(649) | 61 Saphenous nerve |
| *Facial nerve (7th CN)(650) | 73 Tibial nerve |
| *Vestibulocochlear or auditory nerve (8th CN)(651 brain)or(666 half head) | 80 Sympathetic Trunk |
| *Glossopharyngeal nerve (9th CN)(652) | 82 Lumbosacral nerve |
| *Vagus nerve (10th CN)(653) | 83 Sacral Plexus (683) |
| *Spinal accessory nerve (11th CN) (654) | |
| *Hypoglossal nerve (12th CN)(655) | |
| 19 Right Phrenic nerve | |
| 23 Brachial Plexus | |
| 25-26 Thoracic nerve (Lateral & Anterior) | |
| 29 Axillary nerve | |

***CRANIAL NERVES**

ORGANS OF SPECIAL SENSE

EXERCISE 36 ANATOMY OF THE EYE

***Note: You will also be responsible for the eye structures with numbers by them on the eye diagram)**

Small Eye Model (NNN), Large Eye Model NNN, Mannequin [NNN]
(Eye Diagram Lab Manual pg. 364)

Sclera (2)
Cornea (1)
Optic Nerve (14)
Choroid Coat (Uvea or vascular tunic) (6)
Ciliary Body (4-5, 10)
Iris (3)
Pupil (D)
Lens (15)
Vitreous Chamber (Posterior Cavity) (16)
Posterior Chamber
Anterior Chamber
Conjunctiva
Lacrimal Gland (Tear Gland) 100
Retina (9)

Muscles of the Eye

Superior Rectus 3 [138]
Inferior Rectus 4 [139]
Medial Rectus 5 [137]
Lateral Rectus 6 [136]
Superior Oblique 7 [141]
Inferior Oblique 8 [140]

EXERCISE 38 ANATOMY OF THE EAR Small ear models(NNN),Mannequin [NNN]

External:

Auricle (Pinna)(A)
External Auditory Meatus (opening) or External Auditory Canal or
(Ear Canal)(I)
Tympanic Membrane (Tympanum or Eardrum) (II)
Temporal Bone (B)

Middle (Tympanic Cavity):(III)

*Auditory Ossicles
* Malleus (Hammer)(1)
*Incus (anvil)(2)
*Stapes (Stirrup)(3)
Auditory Tube (Eustachian Tube or Pharyngotympanic tube)(5)
Oval Window (7)

Inner:

Semicircular Canals (10-12)
Ampulla (110)
Cochlea (F)
Round Window (4)
Vestibulocochlear or Auditory Nerve (8th CN) (16) [651 or 666]

EXERCISE 58 ANATOMY OF THE DIGESTIVE SYSTEM

PERMANENT DENTITION Text page 882, Lab Manual page 600.

Mannequin numbers NNN, Model numbers (NNN), Tooth Model [NNN]

Tongue 513
Lingual Papillae (vallate papillae) 514 (Lab Manual pp.414-415)
Masseter Muscle 114
Mylohyoid Muscle 134
Incisors 500
Cuspids (Canine Teeth) 501
Bicuspid (Premolar Teeth) 502
Molars 503
Enamel [1]
Dentine [2]
Cementum [10]
Gingiva (gums) 504 [7]
Crown [A]
Root Canal [12]
Apical Foramen [11]
Pulp Cavity [3]
Alveolus (Alveolar Process) [9]
Soft Palate 511
Uvula 512
Parotid Gland 509
Submandibular Gland (Submaxillary Gland) 505/506
Sublingual Gland 508
Epiglottis 414
Pharynx 413
Esophagus 515

Stomach

Cardiac Orifice (cardia) 516
Fundus 517
Greater Curvature 520
Lesser Curvature 519
Pylorus 518
Pyloric sphincter 526
Rugae 525
Greater Omentum 540

Small Intestine

Duodenum 527
Jejunum 537
Ileum 539

Large Intestine

Cecum 544
Ascending Colon 546
Transverse Colon 548
Descending Colon 552
Sigmoid (Pelvic) Colon 553
Taenia Coli 549
Rectum 554

Appendix 545

Pancreas 532 (1)
Pancreatic Duct 535 (4)
Gall Bladder 566 (26)
Hepatic Duct 564 (30)
Cystic Duct 565 (5)
Common Bile Duct 530 (31)
Spleen 381 (20)

Liver

Right Lobe 555
Left Lobe 556
Lobules of Liver 557
Quadrangle Lobe 562
Caudate Lobe 563

EXERCISE 62 ANATOMY OF THE URINARY SYSTEM

KEY FOR KIDNEY, NEPHRON & CORPUSCLE

KIDNEY

- A. Renal medulla
- B. Renal cortex
- 1. Renal vein
- 2. Renal artery
- 3. Ureter
- 4. Renal pelvis
- 5. Renal calyx
- 6. Renal papilla
- 7. Renal pyramid
- 8. Collecting duct
- 9. Distal convoluted tubule
- 10. Loop of Henle
- 11. Proximal convoluted tubule
- 12. Renal corpuscle
- 13. Interlobar arteries
- 16. Arcuate arteries (arciform)
- 16a. Capillary network
- 17. Interlobar veins
- 18. Arcuate veins (arciform)
- 19. Papillary ducts

RENAL CORPUSCLE

- 1. Glomerulus
- 2. Bowman's capsule
- 6. Afferent arteriole
- 7. Efferent arteriole
- 9. Visceral epithelium (Inner lamella)
- 10. Parietal epithelium (Outer lamella)

NEPHRON

- 1. Glomerulus & Bowman's capsule
- 2a. Proximal convoluted tubule
- 2b. Loop of Henle, descending limb
- 3. Loop of Henle, thin portion
- 4c. Loop of Henle, ascending limb
- 4d. Distal convoluted tubule
- 5. Connecting section
- 6. Collecting duct
- 7. Arcuate artery & vein (arciform)
- 8. Interlobular artery & vein
- 11. Capillary network

KEY FOR MANNEQUIN

- 750 Kidney
- 751 Ureter (& 757)
- 758 Urinary Bladder
- 753 Renal Cortex
- 754 Renal Medulla
- 755 Renal Calyx

756 Renal Pelvis

REPRODUCTIVE SYSTEM: MALE & FEMALE (MANNEQUIN)

EXERCISE 66 ANATOMY OF THE MALE REPRODUCTIVE SYSTEM

900 Scrotum
901 Testis
902 Epididymis
903 Ductus deferens (Vas deferens)
904 Ampulla
905 Prostate Gland
906 Ejaculatory duct
907 Bulbourethral or Cowper's Gland
908 Corpus spongiosum
909 Corpora cavernosum penis
911 Glans penis
912 Prepuce (foreskin)
758 Urinary bladder
762 Urethra
80 Pubic symphysis

EXERCISE 67 ANATOMY OF THE FEMALE REPRODUCTIVE SYSTEM

800 Body of uterus
801 Fundus of uterus
802 Cervix of uterus
803 Broad ligament
804 Ovarian ligament
805 Round ligament
806 Ovary
807 Fimbriae of uterine tube
808 Uterine tube (fallopian tubes) (oviduct)
813 Cervical canal
816 Vagina
817 Hymen
818 Labium minus
819 Clitoris
820 Labium majus
758 Urinary bladder
762 Urethra
80 Pubic symphysis

MAMMARY GLAND

850 Breast
851 Areola
852 Nipple
853 Lactiferous ducts
854 Lactiferous sinus (ampulla)
855 Alveolar gland (lobe)
856 Glandular (Alveoli) tissue
857 Adipose tissue

EXERCISE 44 ENDOCRINE SYSTEM: AN OVERVIEW

MANNEQUIN

532 Pancreas (Islets of Langerhans), Abdominopelvic cavity
628 Pineal Gland or Pineal Body, Brain
700 Pituitary Gland or Pituitary Body (Hypophysis), Brain
701 Thyroid Gland, Neck
702 Parathyroid Gland, Neck
703 Suprarenal (Adrenal) Gland, above kidneys
806 Ovary, insert, female
901 Testis, insert, male

BIOLOGICAL SCIENCES 251 -- DEVELOPMENTAL ANATOMY

Definitions that are needed:

Myometrium (muscle layer of uterus) - The layer of smooth muscle tissue within the uterine wall.

Placenta (a = fetal surface, b = maternal surface) - Structure by which a fetus is attached to the mother's uterine wall and to exchange nutrients, gases and wastes between the maternal blood and the embryonic blood and to secrete hormones. a = fetal surface or embryonic portion is composed of the chorion and its villi. b = maternal surface or maternal portion is composed of the area of the uterine wall (decidua basalis) to which the villi is attached. Chorionic villi are projections that extend from the outer surface of the chorion and help attach an embryo the uterine wall.

Umbilical Cord (contains 2 arteries and 1 vein) - A cord like structure that connects the fetus to the placenta. It also functions to suspend the embryo in the amniotic cavity where the amniotic fluid provides a watery environment in which the embryo can grow freely without being compressed by surrounding tissues. The fluid also protects the embryo against being jarred by movements of the mother's body.

Cervical Canal (part of the birth canal) - Lies between the uterus cavity and uterine opening.

Vagina - Tubular organ that leads from the uterus to the vestibule of the female reproductive tract (lower part of the birth canal); female organ of copulation.

Uterine tube (Fallopian tube or oviduct) - Tube that extends from the uterus on each side toward an ovary and functions to transport sex cells.

Fimbriae of uterine tube - A number of irregular, branched extensions on the margin of the infundibulum (the opening end of a uterine or fallopian tube).

Ovary - The primary reproductive organ of a female; an egg-cell producing organ.

Broad ligament - attaches the uterus to the side of the pelvic cavity.

Embryo/fetus - Embryo is an organism in its earliest stages of development (Embryonic stage extends from the 2nd to the 8th week). In humans the fetal stage begins at the eighth week and continues to the time of birth.

Chorion - Embryonic membrane that forms the outermost covering around a developing fetus and contributes to the formation of the placenta. It later fuses with the amnion becoming amniochorionic membrane.

Amnion - An embryonic membrane that encircles a developing fetus and develops the umbilical cord. It contains amniotic fluid, which surrounds the developing fetus.

Endometrium - is the inner lining of the uterus. (Divided into two parts: decidua basalis - deeper portion and decidua paritalis - does not contact with the chorion layer like decidua basalis does.)

Uterus (womb) - is a pear-shaped hollow where the fetus develops.

Cervix (neck of uterus) - narrow inferior end of uterus that leads to the vagina.

Urethra - excretory tube for the bladder (leads from urinary bladder to outside of body).

Urinary Bladder - a hollow muscular organ situated in the pelvic cavity above the pubic symphysis (a temporary reservoir for urine).

Clitoris - small erectile organ located in the anterior (front) portion of the female vulva; corresponds to the penis of the male.

Labium Minus - two (2) small folds of skin lying between the labium majus.

Labium majus - is composed of two (2) longitudinal folds of skin extending downward and backward from the mons pubis of the female. Labia majus encloses and protects the other external reproduction organs.

Pubic symphysis - is a slightly movable cartilaginous joint between the anterior surface of the pelvic bones.

Internal Sphincter Ani (Anal) Muscle - (sphincter means decrease the size of an opening), this muscle provides sphincter like action in the anus canal and vagina.

External Sphincter Ani (Anal) Muscle - is located below the internal sphincter, composed of skeletal muscle.

Rectum - is the terminal end of the digestive tube between the sigmoid colon and the anus. It serves as a temporary storage area for the indigestibles and unabsorbables.

EXERCISE 70 FERTILIZATION AND EARLY DEVELOPMENT

KEY TO DEVELOPMENTAL MODELS

Green based models NNN, White based models (NNN)

Myometrium 1 (7)
Placenta 2 (8)
Umbilical cord 3 (9)
Cervical canal 4 (2)
Vagina 5 (1)
Uterine (fallopian/oviducts) tube 6 (3)
Fimbriae of uterine tube 7 (4)
Ovary 8 (5)
Broad ligament 9 (6)
Embryo/fetus 10 (10)
Chorion 11 (11)
Amnion 12 (12)
Endometrium 13 (13)

KEY TO HALF PELVIS

Model 1 without fetus NNN

Model 2 with fetus (NNN)

Uterus 1 (1)
Placenta 2 (2)
Umbilical Cord 3 (3)
Cervix 4 (4)
Vagina 5 (5)
Urethra 6 (10)
Urinary Bladder 7 (9)
Clitoris 8 (8)
Labium Minus 9 (6)
Labium Majus 10 (7)
Pubic Symphysis 11 (11)
Internal Sphincter Ani Muscle 12a (12a)
External Sphincter Ani Muscle 12b (12b)
Rectum 13 (12)
Abdominal Aorta 15 (25)
Inferior Vena Cava 16 (26)
Right Kidney 17 (24)
Rectus Abdominis Muscle 20 (18)
Spinal Cord 21 (17)