BIOLOGY 2012
HUMAN ANATOMY - Internal
("Where one has to work their phalanges to the periosteum!")
Spring 2018

LAB MANUAL

BIOLOGY 2012

HUMAN ANATOMY - Internal

Spring 2018

Instructor: Donna Newhouse, M.Sc., Ph.D(c)
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Required Texts:

1. Principles of Human Anatomy (12e). Author: Tortora, G. (2016)

2. Atlas of Human Anatomy (4e.). Author: Netter (2015)

3. "Inhouse" Laboratory Manual for Biology 2012. Donna Newhouse (2018)

Teaching Assistants:
Jonathon Avella

****Mark Breakdown:**

Lecture:	2 Exams:	1. Midterm: [30%] (June 2; 6:00 pm)
		2. Final Exam: [30%] (June 13; 6:00-7:45 pm)**
Lab:	1 lab exams:	1. Lab Exam [40%] (June 12; 6:00-8:00 pm)**

****Dates are subject to change**

General Information: Lecture
There are a total of two lecture and one laboratory examinations. The two lecture exams will consist of a variety of questions (mostly fill-in-the-blank type, T/F, MC). The midterm exam will be approximately 125-200 questions. The Final exam will be primarily fill-in-the-blank, short answer, clinical corner, and will consist of approximately 150-200 marks. Two hours will be allotted for the exams. The Midterm Exam will cover information from May 24 to June 3, and the Final Exam will cover information from MT exam to June 19th.

General Information:Laboratory Examinations:
There will be one Lab exam. The lab exam will include approximately 25-50 stations. Each station will have between 2 and 4 "tags" which you will identify within a set period of time. This type of exam is affectionately known as a BELL RINGER! You will be tested on models, radiological, and histological materials.

I welcome you to Biology 2012 (Spring 2018) and hope that your experience in human anatomy will be a stimulating and enjoyable one. If you encounter difficulties, don't endure them in isolation. Often much can be done to help. Don't wait until problems are unmanageable to seek help!

Biology 2012 - Policies

The policies set out below are for the students' benefit. These policies are somewhat stringent and inflexible. These policies are set forth to ensure that all students are treated fairly.

1. All tests must be written in pen to be eligible for mark revision.

2. Simple adding mistakes should be given to Donna Newhouse for correction.

3. When exams are returned, the student has one week to challenge any discrepancies in marking/grading. After one week no mark adjustments will take place. It is therefore in your best interest to review your marked paper when they are returned.

4. If you feel you deserve more marks for a question, attach a note to your paper explaining which question(s) should be re-marked and why. However, should you submit your exam it may be marked in its entirety and thus there is a chance the initial mark may decrease.

5. In the event that a student has to miss a lab or lecture exam for emergency reasons, it will be the student's responsibility to get in touch with Donna Newhouse prior to the scheduled exam. A message may be left at 474-9016.

6. In the event that a student has to miss a lab or lecture exam for medical reasons, the student must submit a signed medical note (from the attending physician) within 7 days after the exam. It is the student's responsibility to get in touch with Donna. Failure to comply with points 5 or 6 will result in a grade of zero for the exam.

7. Video or photographic equipment is/are NOT permitted in the laboratory at any time.

8. All laboratory specimens and models must be treated with the utmost respect and care. The human bones are fragile and irreplaceable. If any breakage should occur please report this to a TA or Donna.

9. There is an established chain of command should you have any problems associated with this course. The chain of command is as follows: T.A.'s...Donna Newhouse...Chairman of Biology...Dean of Science and Environmental Studies...V.P. Academics...Dr. Stevenson (...Daltan McGinty...Stephen Harper!!!). Issues or problems should be resolved at the lowest level possible. (Dr. Stevenson shouldn't have to resolve the problem of a half mark injustice on a lab exam!)

****SUBJECT TO CHANGE**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
May 27	**May 28** **LECTURE** 6:00-9:00 pm	**May 29** **LAB** 7:00-9:00 pm	**May 30** **LECTURE** 6:00-9:00 pm	**May 31** **LAB** 7:00-9:00 pm	**June 1** **LECTURE** Assigned Reading	**June 2**
June 3	**June 4** **LECTURE** Assigned reading **LAB** 7:00-9:00 pm	**June 5** **LECTURE** 6:00-9:00 pm	**June 6** **LECTURE** 6:00-9:00 pm	**June 7** **LECTURE** 6:00-9:00 pm	**June 8** **MT EXAM** **6:00-7:45 pm**	**June 9**
June 10	**June 11** **LECTURE** 6:00-8:00 pm **LAB** 8:00-10:00 pm	**June 12** **LECTURE** 6:00-8:00 pm **LAB** 8:00-10:00 pm	**June 13** **LECTURE** 6:00-8:00 pm **LAB** 8:00-10:00 pm	**June 14** **LAB** 6:00-10:00 pm	**June 15** **LECTURE** 6:00-8:00 pm **FINAL LAB EXAM** **8:00-10:00 pm**	**June 16** **FINAL LEC EXAM** **6:00-7:45 pm**

LECTURE OUTLINE
(Subject to Change)

I. Nervous System
- A. Organization
- (1) anatomical classification
  - (a) central nervous system
  - (b) peripheral nervous system
- (2) functional classification
  - (a) cerebrospinal fluid
  - (b) autonomic system

- B. Gross anatomy
- (1) central nervous system
  - (a) meninges
  - (b) major regions of the brain
  - (c) spinal cord
- (2) peripheral nervous system
  - (a) cranial nerves
  - (b) spinal nerves
- (3) autonomic nervous system
  - (a) sympathetic division
  - (b) parasympathetic division

INTERNAL ANATOMY
II. Respiration
- A. General comments
- B. Nose
- C. Sinuses of skull
- D. Pharynx
- E. Larynx
  - (1) location and function
  - (2) cartilages
  - (3) vocal cords
  - (4) muscles
- F. Trachea
- G. Bronchi
- H. Lungs
- I. Muscles and nerves involved in breathing

III. Circulatory System
- A. Microscopic anatomy (vascular connective tissue)
  - (1) plasma
  - (2) formed elements (erythrocytes, leukocytes, thrombocytes)
- B. General functions
  - (1) transportation
  - (2) protection
  - (3) maintenance of homeostasis
- C. Heart
  - (1) pericardium
  - (2) layers of the heart (epicardium, myocardium, endocardium)
  - (3) chambers and valves
  - (4) 'neuromuscular' tissue
  - (5) nerve supply to the heart
- D. Arterial blood vessels
  - (1) aorta
  - (2) arteries of the head and neck
  - (3) arteries of upper limb
  - (4) arteries of abdomen
  - (5) arteries of lower limb
- E. Venous blood vessels
  - (1) veins of head and neck
  - (2) veins of thorax
  - (3) veins of upper limb (deep and superficial)
  - (4) veins of lower limb (deep and superficial)
  - (5) veins of the pelvis and abdomen (hepatic portal system)

IV. Digestion
- A. Functions
- B. General review of structures involved
- C. Mouth
  - (1) salivary glands
  - (2) teeth
  - (3) muscles of mastication
- D. Pharynx
- E. Esophagus
- F. Stomach
- G. Liver
- H. Pancreas
- I. Small intestine
- J. Large intestine
- K. Rectum, anus

V. Reproductive System
- A. General comments
- B. Male reproductive structures
  - (1) scrotum
  - (2) testes (enclosing capsule, seminiferous tubules)
  - (3) epididymis
  - (4) vas deferens
  - (5) seminal vesicles
  - (6) prostate gland
  - (7) Cowper's glands
  - (8) urethra
  - (9) penis

C. Female reproductive structures
- (1) ovaries
- (2) fallopian tubes
- (3) uterus
- (4) vagina
- (5) external structures

VI. Urinary System
- A. Functions
- B. Kidney
  - (1) gross anatomy
  - (2) microscopic anatomy
- C. Ureter
- D. Bladder
- E. Urethra

VII. Special Sensory Structures
- A. Structure of the eye
  - (1) orbit
  - (2) eyelids
  - (3) lacrimal apparatus
  - (4) extrinsic muscles
  - (5) internal structure

THE CNS, PNS, INTERNAL ANATOMY and SPECIAL SENSES

The Nervous System - Structures you are responsible to know

1. Twelve cranial nerves

2. Cerebrum: frontal lobe, parietal lobe, temporal lobe, occipital lobe, longitudinal cerebral fissure, central sulcus

corpus callosum: genu, body, splenium, anterior commissure, intermediate commissure (interthalamic adhesion), posterior commissure

thalamus
hypothalamus
choroid plexus
pineal gland (body)
optic chiasm
pituitary gland: infundibulum
mammillary body

3. Cerebellum: arbor vitae

4. Brainstem: medulla oblongata, pons, midbrain (cerebral peduncle)

5. Spinal cord
gray matter: ventral (anterior) horn, lateral horn, dorsal (posterior) horn, commissure
white matter
anterior white commissure
ventral median fissure
dorsal median sulcus
central canal
epidural space (fat in epidural space)
dura mater
arachnoid mater
subarachnoid space
pia mater
ventral root
dorsal root
spinal ganglion (dorsal root ganglion)
ventral ramus
dorsal ramus
spinal nerve

sympathetic trunk
rami communicans (gray and white)
denticulate ligament
ligamentum flavum

vertebral artery/vein
superficial peroneal n
deep peroneal n.
common peroneal n.
saphenous n.
sciatic n.
posterior tibial n.
iliohypogastric n.
femoral n.
obturator n.
intercostal nn.
phrenic n.
axillary n.
median n.
ulnar n.
radial n.
musculocutaneous n.

cervical plexus
brachial plexus
lumbar plexus
sacral plexus

mental n.
infraorbital n.
supraorbital n.
facial n.

INTERNAL ANATOMY
Digestive, Respiratory, Urinary, Reproductive and Cardiovascular Systems and Special Senses

Internal Anatomy: Models

You are responsible for all of the visceral organs found in the body. You should familiarize yourself with structures specific to certain viscera.

Structures of the male sexual organ:

prepuce	external anal sphincter (m)	internal anal sphincter
cremaster m.	pyramidalis m.	rectus abdominis m.
rectum	ureter	urinary bladder
urethra	prostate gland	prostatic urethra
seminal vesicle	ductus (vas) deferens	spermatic cord
scrotum	corpus spongiosum	testis
epididymis	corpus cavernosum	
penis	pampiniform venous plexus	
glans penis		

Structures of the female sexual organ:

ureter	external anal sphincter	internal anal sphincter
pyramidalis m.	rectus abdominis m.	rectum
labium majora	labium minora	clitoris
round ligament	ovarian ligament (proper)	fallopian tube
broad ligament	ovary	vagina
uterus	cervix	fornix of vagina
urinary bladder	urethra	

Structures of the kidney:

renal a.	renal v.	medulla
cortex	renal pyramid	renal papilla
renal pelvis	major calyces	minor calyces
ureter	loop of Henle	interlobular a.
interlobar v.	arcuate a.	afferent arteriole
efferent arteriole	arcuate v.	glomerulus

Structures of the liver:

right lobe	left lobe	caudate lobe
quadrate lobe	falciform ligament	gallbladder

Structures of the Intestines:

duodenum	jejunum	ileum	rectum
cecum	appendix	ileocecal valve	
ascending colon	transverse colon	descending colon	
haustra	greater omentum	right (hepatic) colic flexure	
epiploic appendices	sigmoid colon	left (splenic) colic flexure	

Structures of the Larynx:
Hyoid, thyroid cartilage, cricoid cartilage, arytenoid cartilage, corniculate (Santorini) cartilage, cuneiform (Wrisberg's) cartilage, tracheal cartilages

Structures of the lung:

superior lobe	middle lobe	inferior lobe
oblique fissure	horizontal fissure	lingula of lung
apex	cardiac notch	hilus

Miscellaneous structures:
spleen, thymus gland, thyroid gland, adrenal glands, inguinal ligament

THE CIRCULATORY SYSTEM

Structures of the **Human Heart** (that you are responsible for)

atrium
auricle
ventricle
apex
base
superior vena cava
inferior vena cava
ascending aorta
arch of aorta
descending aorta
brachiocephalic a. (trunk)
left common carotid a.
left subclavian a.
ligamentum arteriosum
right coronary a.
left coronary a.
posterior interventricular a. (post. descending br. of rt. coronary a.)
anterior interventricular a. (ant. descending br. of lt. coronary a.)
circumflex a.
great cardiac v.
coronary sinus
pulmonary trunk
pulmonary aa.
pulmonary vv.
brachiocephalic vv.
fossa ovalis (remnants)
tricuspid valve
bicuspid (mitral) valve
semilunar valve of pulmonary a.
semilunar valve of aorta
papillary mm.
chordae tendineae
trabeculae
pectinate m.
moderator band
trachea
bifurcation of trachea (carina)
right bronchus
left bronchus

Vessels of the lower extremities:

external iliac a.
internal iliac a.
obturator a.
superior gluteal a.
inferior gluteal a.
internal pudendal a.
femoral a.
deep femoral a. (profundus)
popliteal a.
posterior tibial a.
anterior tibial a.
dorsalis pedis a.
external iliac v.
femoral v.
greater saphenous v.
lesser saphenous v.

Vessels of the upper extremities:

axillary a.
brachial a.
radial a.
ulnar a.
anterior humeral circumflex a.
superficial palmar br. of radial a.
princeps pollicis a.
common palmar digital aa.
proper palmar digital aa.
superficial palmar arch

Vessels of the head and neck:

superficial temporal a.
maxillary a.
common carotid a.
subclavian a.
internal carotid a.
internal jugular v.
external jugular v.

Vessels of the abdomen:

left gastric a.
superior mesenteric a.
celiac trunk
splenic v.
abdominal aorta
renal v.
testicular (ovarian) a.
common iliac v.
inferior mesenteric v.
hepatic a.
superior mesenteric v.
splenic a.
renal a.
common iliac a.
inferior mesenteric a.

SENSORY STRUCTURES

Structures of the eye:

sclera	cornea	retina
choroid	iris	lens
pupil	vitreous humor	optic papilla
macula	fovea centralis	retinal vv.
retinal aa.	superior oblique m.	inferior oblique m.
lateral rectus m.	medial rectus m.	superior rectus m.
inferior rectus m.	lacrimal gland	optic nerve

Structures of the ear:

auricle	oval (vestibular) window
external acoustic meatus	round (cochlear) window
tympanic membrane	lateral semicircular canal

malleus (a) head (b) neck (c) manubrium
incus (body, short crus, long crus, lenticular process of incus)
stapes (head, anterior crus, posterior crus, base

posterior semicircular canal	cochlea
vestibulocochlear n. (CN VIII)	internal acoustic meatus
anterior (superior) semicircular canal	tensor tympani m.