BIOLOGY 2012
INTERNAL ANATOMY
2023

COURSE SYLLABUS/LAB MANUAL

BIOLOGY 2012
INTERNAL ANATOMY

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Required Texts:	Principles of Human Anatomy (13e) Author: Tortora & Nielsen (2017) Atlas of Human Anatomy (7e) Author: Netter (2017)
Lectures:	M/W ATAC 1001 5:30-7:00 pm
Labs:	Tuesday or Wednesday CB 3012 & 3015 7:00-10:00 pm

Mark Breakdown

Lecture:	Topics	Course Weight	Date/Time
MT	CNS, PNS Internal Anatomy	30%	Feb 15, 2023 (5:30 pm)
Final	Jan-April with emphasis on material covered from MT onward	40%	TBA
Lab:			
Lab Exam	All systems	30%	Mar 28 & 29, 2023 (7:00 pm)

General Information: Lecture and Laboratory Examinations

There are a total of two lecture and two laboratory quizzes/tests/examinations. The two lecture quizzes will consist of a variety of questions (mostly fill-in-the-blank type, T/F, MCQ). The lecture test will be written during class time and will be worth approximately 100-125 marks. The Final exam will be primarily fill-in-the-blank, short answer, clinical corner, and will consist of approximately 150-300 marks. Eighty (80) minutes and three (3) hours will be allotted for the quiz and the exam, respectively. The final exam will cover information from January through April, ***but the majority of information covered will be from the midterm onward.***

There will be one lab test and 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.

All lab and lecture quizzes/tests/exams are rounded up to the nearest whole number. Therefore, no additional marks are awarded individuals at the end of the course.

Students earning a mark of 70% or greater at the completion of this course (and Biol 2011) will be eligible to serve as Teaching Assistants in succeeding years. This is an excellent learning experience and a great way to earn money. Teaching assistants are selected by the Instructor and while a minimum of 70% is required, earning 70% or better does not in itself entitle anyone to serve as a T.A. While scores earned may serve as one of the factors in making the selection, other factors such as communication skills, ability to get along with others, positive attitudes, etc. will also be used in making the selection. The number of T.A.'s hired each year depends upon course enrollment and budgetary considerations.

I welcome you to Biology 2012 and hope that your experience in this course 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. Given the fact that approximately 150 students are enrolled in this course, it necessitates some structure pertaining to writing and marking of exams. 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 will 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.

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. You may come to lab periods other than your own to do extra studying EXCEPT for the week before the Lab exams.

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

9. All laboratory specimens and models must be treated with the utmost respect and care. If any breakage should occur please report this to a TA or Donna.

10. 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. McPherson. Issues or problems should be resolved at the lowest level possible (Dr. McPherson shouldn't have to resolve the problem of a half mark injustice on a lab exam!).

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

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. Bronchial tree
- 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)
F. Fetal circulation
G. Lymphatic System
(1) lymph system
(2) lymph nodes

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

VI. 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

VII. Special Sensory Structures
- A. Nerve endings in skin
- B. Olfactory sense
- C. Taste receptors
- D. Structure of the eye
  - (1) orbit
  - (2) eyelids
  - (3) lacrimal apparatus
  - (4) extrinsic muscles
  - (5) internal structure
- E. Structure of the ear
  - (1) external ear
  - (2) middle ear
  - (3) inner ear

VIII. Endocrine System
- A. General functions (comparison with nervous system)
- B. Location, specific function and anatomy of glands

THE CNS, PNS, INTERNAL ANATOMY and SPECIAL SENSES

Students are responsible to know all the structures listed on pages 11-16 for the LAB EXAM.

The Nervous System:

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

Structures of the female sexual organ:

ureter	external anal sphincter	internal anal sphincter
urethra	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		

Structures of the kidney:

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

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
thoracic aorta
abdominal aorta
brachiocephalic trunk
L/R common carotid a.
L/R subclavian a.
ligamentum arteriosum
R. coronary a.
L. coronary a.
posterior interventricular a.
anterior interventricular a.
circumflex a.
great cardiac v.
coronary sinus
pulmonary trunk
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 carnae
pectinate m.
moderator band
trachea
pulmonary aa.
bifurcation of trachea (carina)
right bronchus
left bronchus
middle cardiac v.

Vessels of the lower extremities:

Common iliac a.
external iliac a/v.
internal iliac a/v.
obturator a.
superior gluteal a.
inferior gluteal a.
internal pudendal a.
femoral a/v.
deep femoral a. (profundus)
popliteal a.
posterior tibial a.
anterior tibial a.
dorsalis pedis a.
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 ulnar 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.
external carotid a.
internal jugular v.
external jugular v.

Vessels of the abdomen:

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

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.