

BIOLOGY 2011
HUMAN ANATOMY - MSK
(“Where one has to work their phalanges to the periosteum!”)
Spring 2015

LAB MANUAL



General Information: Lecture

There are a total of two lecture exams (MT & Final) and two 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 150-300 marks. The Midterm (MT) Exam will cover information from May 4th to May 12th, and the Final Exam will cover information from MT to May 25th.

General Information:Laboratory Examinations:

There will be a total of two lab exams. Each 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 bones, models, prosected specimens, radiological, and histological materials.

I welcome you to Biology 2011 (Spring 2015) 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 2011 - 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. 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 3	May 4 LECTURE AT 1001 6:00-10:00	May 5 LECTURE AT 1001 6:00-10:00	May 6 LAB Integument & Bones 6:00-10:00	May 7 LAB Integument & Bones 6:00-10:00	May 8 LAB Bones & Muscles 6:00-10:00	May 9
May 10	May 11 LECTURE AT 1001 6:00-10:00	May 12 LECTURE AT 1001 6:00-10:00	May 13 LAB Bones & Muscles 6:00-10:00	May 14 LEC/LAB EXAM 6:00-10:00 pm	May 15	May 16
May 17	May 18 HOLIDAY	May 19 LAB Bones & Muscles 6:00-10:00	May 20 LAB Bones & Muscles 6:00-10:00	May 21 LECTURE AT 1001 6:00-10:00	May 22 LECTURE AT 1001 6:00-10:00	May 23
May 24	May 25 LECTURE AT 1001 6:00-10:00	May 26 LEC EXAM 6:00-8:00 pm LAB EXAM 8:00-10:00 pm	May 27	May 28	May 29	

LECTURE OUTLINE

(Subject to Change)

I. Introduction

A. Objectives of the course

II. Integumentary System

III. Skeletal System (Osseous connective tissue)

A. Review of Human Bones

(1) axial division

- (a) skull (cranium, facial bones)
- (b) hyoid bone
- (c) trunk (vertebrae, ribs, sternum)

(2) appendicular division

- (a) upper (pectoral) appendages
- (b) lower (pelvic) appendages

B. Muscular System

- a) properties of skeletal muscle tissue
- b) structure and function of skeletal muscles

C. Principle muscles of the body

(1) Muscles of facial expression & mm. that move the axial skeleton

(2) Muscles of upper extremity

- (a) shoulder joint
- (b) muscles moving the shoulder
- (c) muscles moving the upper arm
- (d) muscles moving the lower arm
- (e) muscles which move the hand
- (f) muscles which move the fingers and thumb (forearm/hand)

(3) Muscles of the lower extremity

- (a) hip joint
- (b) muscles which move the thigh
- (c) muscles which move the lower leg
- (d) muscles which move the foot and toes

SKELETAL SYSTEM AND JOINTS

You are responsible for the ligaments associated with the knee, shoulder, elbow, and hip. Models are available for this purpose.

The following is a list of the bones and their parts that you are required to know for lab. Please note that you should also be able to tell if major bones are from the right or left side, which end is proximal or distal and with which bone(s) they articulate.

Integument

Epidermis

stratum. corneum
stratum spinosum

stratum lucidum
stratum basale

stratum granulosum

Dermis

papillae

touch corpuscles (Meissner's)

Hypodermis

Adipose
sudoriferus (sweat) gland
hair bulb
arrector pili mm

lamellated corpuscles
hair shaft
hair papilla
Pacinian corpuscles

root
sebaceous glands

1. Skull (see Appendix A)

A. Cranium

Frontal bone:

Sinuses	supra-orbital margin	supra-orbital notch (foramen)
coronal suture		

Parietal bone:

Squamosal suture	lambdoidal suture	sagittal suture
grooves of middle meningeal arteries		

Temporal bone:

Mastoid process	mandibular fossa	zygomatic process
stylomastoid foramen	styloid process	petrous portion,
squamous portion		
external auditory (acoustic) meatus		
internal auditory (acoustic) meatus		

Occipital bone:

Foramen magnum	occipital condyles	jugular foramen
hypoglossal (canal) foramen		
groove of transverse sinus		
groove of sigmoid sinus		

Sphenoid bone:

Sinuses	foramen ovale	optic foramina,
foramen rotundum	foramen spinosum	sella turcica
superior orbital fissure		
inferior orbital fissure		

Ethmoid bone:

Crista galli	cribriform foramina (plate),
perpendicular plate	

B. Facial Bones

Maxilla:

Sinuses	palatine process	alveolar process,
infraorbital foramina		

Mandible:

Condylod process	coronoid process	ramus
alveolar border	angle	mental foramen
mandibular foramen	lingula	body
symphysis (mental protuberance)		

Nasal bones

Lacrimal bones

Inferior nasal conchae

Zygomatic bones

Vomer bone

Palatine bone

C. Ear Ossicles

Malleus

Incus

Stapes

(**Hammer, anvil and stirrup are NOT acceptable!)

Hyoid Bone

Greater horn

lesser horn

body

Vertebrae General features:

Body

superior articular surface

spine (spinous process)

transverse foramina (if present)

pedicle

transverse process

inferior articular surface

lamina

Types: (look up the structures unique to these vertebrae including Atlas and Axis)

Cervical

Thoracic

Lumbar

Sacrum:

Ala

body

anterior sacral foramina

posterior sacral foramina

Coccyx

Ribs:

Head

neck

tubercle

costal groove

(You are not responsible to be able to tell the ribs apart, except for the unique ones such as the floating ribs)

Sternum:

Jugular notch	manubrium	sternal angle
Body	xiphoid process	

Scapula:

Vertebral (medial) border		axillary (lateral) border,
glenoid fossa (cavity)	acromion	spine
supraspinous fossa	infraspinous fossa	inferior angle
subscapular fossa	coracoid process	

Clavicle:

Medial (sternal) end	lateral (acromial) end	conoid tubercle
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Humerus:

Head	deltoid tuberosity	capitulum
coronoid fossa	olecranon fossa	trochlea
medial epicondyle	lateral epicondyle	
greater tubercle	lesser tubercle	

Ulna:

Semilunar (trochlear) notch	olecranon	coronoid process
radial notch	head	styloid process

Radius:

Head	radial tuberosity	neck
styloid process		

Carpals (wrist bones):

Scaphoid	Lunate	Trapezium	Capitate
Triquetral (triquetrum)	Pisiform	Trapezoid	Hamate

Hand (Manus) Bones;

Metacarpals	phalanges (distal, middle, proximal)
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Coxal (Hip) Bones:

Ilium	ischium	pubis
symphysis pubis	acetabulum	obturator foramen
greater sciatic notch	lesser sciatic notch	ischial spine
anterior superior iliac spine	anterior inferior iliac spine	
posterior superior iliac spine		
posterior inferior iliac spine		
ischial tuberosity		

Femur:

Head	linea aspera	neck
lateral condyles	medial condyle	intercondylar fossa
lateral epicondyle	medial epicondyle,	
greater trochanter	lesser trochanter	

Patella:

Base	apex
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Tibia:

Lateral condyle malleolus	medial condyle intercondylar eminence	tibial tuberosity medial
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Fibula:

Head	lateral malleolus
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Tarsal (Ankle) Bones:

Talus, 1st, 2nd, 3rd cuneiform (medial, intermediate, lateral)	navicular	cuboid	calcaneus
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Foot Bones:

Metatarsals	phalanges (distal, middle, proximal)
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Model of Bone:

Periosteum osteocyte	lamellae Volkmann's canal	Sharpey's fibres osteon
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The following is a list of structures associated with the knee, shoulder, elbow, and hip joints which you are responsible to know:

Knee:

anterior cruciate ligament	posterior cruciate ligament,
medial meniscus	lateral meniscus
medial (tibial) collateral ligament	
lateral (fibular) collateral ligament	
posterior menisofemoral ligament	
quadriceps tendon	
patellar ligament	

Shoulder:

acromioclavicular ligament	coracoclavicular (conoid & trapezoid) lig
coracoacromial ligament	coracohumeral ligament
long head of biceps tendon	transverse humeral retinaculum
superior transverse scapular ligament	

Elbow:

medial collateral ligament	lateral collateral ligament
annular ligament	

Hip:

iliofemoral ligament	ischiofemoral ligament
pubofemoral ligament	

MUSCULAR SYSTEM

This section lists what you need to know for both the cat and the human in the lab portion of the course. In addition to being able to identify muscles, you are responsible for origin(s), insertion(s) and action(s) for the major muscle groups in the human.

The only tendon you should know is the Achilles (calcaneal) tendon.

The following is a list of muscles you should know in the human:

Head/Neck Region

masseter	sternocleidomastoid
temporalis (temporoparietal)	sternozyoid
buccinator	sternothyroid
orbicularis oris	thyrozyoid
orbicularis oculi	stylozyoid
frontalis (occipitofrontalis)	anterior scalene
occipitalis (occipitofrontalis)	middle scalene
zygomaticus (major + minor)	posterior scalene
platysma	levator scapulae

Thoracic/Abdominal Region

pectoralis minor	rectus abdominis
pectoralis major	transversus abdominis
internal abdominal oblique	serratus anterior
external abdominal oblique	intercostals (internal/external)

Back Region

latissimus dorsi	rhomboides major
erector spinae	trapezius
rhomboides minor	quadratus lumborum

Upper Extremity

teres minor	extensor carpi radialis longus
teres major	extensor carpi radialis brevis
supraspinatus	brachioradialis
infraspinatus	extensor digitorum
subscapularis	extensor carpi ulnaris
deltoid	flexor pollicis brevis
Serratus anterior	abductor pollicis brevis
Pectoralis major	extensor pollicis brevis
Pectoralis minor	extensor pollicis longus
biceps brachii (long & short heads)	adductor pollicis
brachialis	abductor pollicis longus
coracobrachialis	supinator
Pronator teres	pronator quadratus
Flexor carpi radialis	Opponens pollicis
Palmaris longus	

Flexor carpi ulnaris
Flexor digitorum superficialis
Flexor digitorum profundus

abductor digiti minimi
flexor digiti minimi
opponens digiti minimi
lumbricals

Lower Extremity

Iliacus
psoas major
psoas minor
piriformis
iliopsoas
tensor fasciae latae
sartorius
superior gemellus
inferior gemellus
obturator internus
gluteus maximus
gluteus medius
gluteus minimus
rectus femoris
vastus lateralis
vastus medialis
vastus intermedius
pectineus
adductor longus
adductor brevis
adductor magnus
gracilis

semitendinosus
semimembranosus
biceps femoris (long & short heads)
tibialis anterior
extensor hallucis longus
extensor digitorum
peroneus longus
peroneus brevis
gastrocnemius
soleus
plantaris
popliteus
flexor hallucis longus
tibialis posterior
flexor digitorum longus
iliotibial band (ITB)
inguinal ligament