

# BIOL 241: Human Anatomy and Physiology I

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## Syllabus

Spring 2009

Instructor: Joel Dahms  
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Office: IB 2324C  
Office hours: By appointment  
Office phone: 527-3755 (Voice mail only)

Class meeting times:  
MW 6:00PM-7:40PM in: AS1521 (lecture)  
MW 7:50PM- 9:30PM in: AS1615 (lab)

Course Website: <https://frontpage.northseattle.edu/anp213jd>  
(Note that the website address starts with **https**)

User ID: <b>anp213jd</b>
Password: <b>neuron</b>

### Required texts

- *Human Anatomy and Physiology*, Seventh Ed., Elaine N. Marieb & Katja Hoehn, Pearson Benjamin Cummings, 2007.
- *Human Anatomy and Physiology Laboratory Manual*, Eighth Ed., Elaine N. Marieb & Susan J. Mitchell, Pearson Benjamin Cummings, 2008.
- *A Brief Atlas of the Human Body*, Second Ed., Matt Hutchinson et al., Pearson Benjamin Cummings, 2007.

### Optional Texts

- *Study Guide for Human Anatomy and Physiology*, Seventh Ed., Elaine N. Marieb & Katja Hoehn, Pearson Benjamin Cummings, 2007.
- *The Anatomy Coloring Book*, Third Ed., Wynn Kapit and Lawrence M. Elson, Benjamin Cummings, 2001.
- *The Physiology Coloring Book*, Wynn Kapit, Robert I. Macey, and Lawrence Meisami, Second Ed., Benjamin Cummings, 2000.

### Grading

Exams	(400 points)
Lab Practicals	(200 points)
Laboratory Exercises	(200 points)
Quizzes & Assignments	(100 points)
<b>Total</b>	<b>(900 points)</b>

Grades will be assigned as follows:

<b>Percent</b>	<b>Grade</b>	<b>Decimal Grade</b>	<b>Percent</b>	<b>Grade</b>	<b>Decimal Grade</b>
95 - 100%	A	3.9 - 4.0	65 - 69	C	1.9-2.1
90 - 95	A-	3.5 - 3.8	60 - 64	C-	1.5-1.8
85 - 89	B+	3.2 - 3.4	57 - 59	D+	1.2-1.4
80 - 84	B	2.9 - 3.1	53 - 56	D	0.9 - 1.1
75 - 79	B-	2.5 - 2.8	50 - 52	D-	0.7 - 0.8
70 - 74	C+	2.2 - 2.4	< 50%	E	0.0

**Note:** a 4.0 grade requires a 96%

### **Commitment**

Anatomy and Physiology is a course that requires a strong commitment in order to succeed. It is not an easy course: the subject-matter is difficult and learning the terminology can be like learning a foreign language. To successfully complete this course you must commit to attend all lectures and laboratory sessions and plan on spending at least an additional 20 hours per week of studying time. This will include not only reading the text but also several hours per week studying laboratory materials (e.g. microscope slides, bones, muscles) for practical quizzes. Additional resources such as computerized review programs, audiovisual materials and student tutors are available during the **open laboratory** sessions (see below).

### **Attendance**

Students should attend every class session, especially since the class only meets twice a week; missing even one class session can leave you way behind. If you miss a class session, it is *your responsibility* to obtain the lecture notes, handouts, assignments or other materials distributed in class. If you must miss class due to prolonged illness or other unexpected circumstances, you should notify the instructor as soon as possible to make special arrangements.

### **Lectures**

Due to the amount of information covered in the course, lectures cannot cover all the relevant material. Students will be responsible for all the material in the chapters covered unless otherwise noted. However, in order to help students determine what to focus on, **objectives** for each unit are available on the course website.

### **Objectives**

There are five units in BIOL 241, each with an exam at the end. The objectives for each unit are designed to give students a general list of learning outcomes for the unit, and to serve as a study guide for the exams and quizzes. They cover *most* of the things you need to know; however, they are **not exhaustive**.

### **Labs**

Many laboratory exercises must be completed in the laboratory. You will need to complete the questions found in the lab manual at the end of each lab entitled "Review Sheet" and turn it in to me the following week each lab. **NOTE: you must turn in the actual pages torn out of a laboratory manual; no photocopies will be accepted.** You

must also include any data obtained from the lab exercise or drawings of microscope slides. Students who miss a laboratory exercise must make arrangements to complete the activities during open lab time in order to get credit for that exercise. Students who report data obtained from another student will receive the grade of 0 for that exercise.

### **Open laboratory**

There will be specified times each week that the laboratory room will be open to students and staffed by student tutors who have taken A&P before; often, there will also be open lab time on the weekend. During these times, you will be able to make up missed labs (with some exceptions), study the lab materials for upcoming lab practicals and exams, and have your questions answered by the student tutors. The schedule of open lab times should be available during the first week of the quarter and open lab times usually start in the second week of class.

### **Quizzes**

There will be three in-class quizzes in the weeks without an exam or lab practical (weeks 1, 3, and 10). These will be written quizzes that cover material from lectures and labs and will take about 15 minutes. They are designed to prepare you for the type of questions that will be on the exams and keep you up to date with your studying. The quizzes will be worth 20 - 25 points each. More details about the quizzes will be announced in class.

### **Exams**

There will be five exams, the first four worth 75 points and the final worth 100 points. The exams will be composed of multiple-choice questions, matching, short answer, fill-in-the-blank and short essay questions and may include diagrams for you to label. A new, unwrinkled Scantron form and a #2 pencil will be needed for each exam. These are available at the campus bookstore or at the Munch Mart. The exam will contain questions pertaining to **all** the objectives listed for the unit. It is assumed that each student will do their own work. Cheating is unacceptable and will be referred to the Vice President of Student Affairs for disciplinary action. **NOTE: Exams may not be rescheduled or made-up due to tardiness or absence. Students with extraordinary circumstances should discuss them with the instructor as soon as the situation occurs.** If you know ahead of time that you will miss an exam, let the instructor know as far ahead of time as possible.

### **Lab Practical**

There will be four lab practical quizzes, each worth 50 points. These are designed to test your “practical” ability to identify cells, tissues, bones, muscles and other structures from slides, models, or diagrams. Consult the **Lab Practical Study Guide** (attached) for details on what you are expected to know for each practical.

### **Assignments**

There will be two or three assignments during the quarter as determined by available time. I will provide more details about these as the quarter progresses.

**BIOL 241 Lecture & Lab Schedule**

\* These chapters will not be covered in lecture but you ARE responsible for the content of these chapters

Week	Dates	Topics - Chapters Covered	Lab Exercises
1	4/6-4/8	Introduction - 1 Chemistry review - 2 Cell membranes and physiology - 3	M: Lab Safety & Introduction Lab #3 Microscope use W: Lab #4 Cell anatomy
		◊ <b>Quiz 1</b> – Wed 4/3	
2	4/13-4/15	Cell anatomy - 3 Central dogma - 3	M: Lab #5A-Cell Transport W: Lab #5A (Cont'd)
		● <b>Exam 1 (Chaps 1-3)</b> Wed 4/15	
3	4/20-4/22	Epithelial tissue - 4 Connective tissue - 4 Body membranes – 4	M: Lab #6A-Tissues, Epithelia W: Lab #6A-Tissues, Connective
		◊ <b>Quiz 2</b> – Wed 4/22	
4	4/27-4/29	Integumentary system - 5 Bone structure & physiology - 6	M: Lab #7-Integumentary W: Lab #9-Skeletal overview Histology review
		● <b>Exam 2 (Chaps 4, 5)</b> Wed 4/29	
5	5/4-5/6	Bone growth & repair - 6, 7*	M: Lab #10-Axial skeleton W: Lab #10 (Cont'd)
			● <b>Practical 1: Histology</b> Wed 5/6
6	5/11-5/13	Articulations - 8 Muscle structure - 9	M: Lab #11-Appendicular skeleton W: Lab #13-Articulations <b>Split femur demo</b>
		● <b>Exam 3 (Chaps 6, 7)</b> Wed 5/13	
7	5/18-5/20	Muscle metabolism - 9, 10* Neurophysiology I - 11	M: Lab #14-Muscle overview Vernier Muscle Fatigue Lab (H/O) W: Lab #15-Gross anatomy of muscles
			● <b>Practical 2: Bones</b> Wed 5/20
8	5/25*-5/27	Neurophysiology II - 11 Synapses & Neurotransmitters	M: <b>No class (Memorial Day)</b> W: Lab #15-Gross muscles (cont'd)
		● <b>Exam 4 (Chaps 8 – 10)</b> Wed 5/27	
9	6/1-6/3	CNS: Brain - 12	M: Lab #17-Nervous tissue W: Lab #18B-Neurophysiology
			● <b>Practical 3: Muscles</b> Wed 6/3
10	6/8-6/10	CNS: Spinal Cord - 12 Peripheral Nervous System - 13	M: Lab #19-Brain anatomy <b>Brain dissection</b> W: Lab #21-Spinal cord <b>Spinal cord demo</b>
		◊ <b>Quiz 3:</b> Wed 6/10	
11	6/15-6/17	Autonomic Nervous System - 14 Special Senses - 15	M: Lab #22-Reflexes
			● <b>Practical 4: Brain &amp; CNs</b> Mon 6/15
	Wed 6/17	● <b>Final Exam (Chaps 11 – 15)</b> 6 - 8pm	

# 213 Lab Practical Study Guide

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Spring 2009

Four practical quizzes will be administered in the lab and will test your knowledge of both gross anatomy and microscopic anatomy (histology). Each will be worth 50 points and may be made up of microscope slides, projected Powerpoint slides, models, and fresh tissues. You will have time in lab to learn the material for these and additional time available during open labs. **This guide is subject to change throughout the quarter** so be sure to get any updates from me about what will be covered on each practical.

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**For Lab Practical Exam #1 (Wed 5/6) you should know the following:**

## Histology

Be able to identify the following tissues microscopically:

- *Epithelia*: simple squamous, simple cuboidal, simple columnar, psuedostratified ciliated columnar, transitional, stratified squamous, stratified columnar
- *Connective tissues*: loose CTPs (areolar, adipose, reticular), Dense CTPs (dense regular, dense irregular, elastic), cartilage (hyaline, elastic, fibrocartilage), blood

## Integumentary System:

- Be able to identify the following structures microscopically: epidermis (all of the layers), dermis (reticular and papillary), sweat glands (apocrine, merocrine), sebaceous glands, sebaceous follicles, arrector pillus muscle
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**For Lab Practical Exam #2 (Wed 5/20) you should know the following:**

## Axial skeleton

- Know all the bones and bone parts listed on the **List of bones and bone parts – Axial** found attached to the syllabus (and also available on the website). This portion will be made up of skulls and disarticulated bones.

## Appendicular Skeleton

- Know all the bones and bone parts listed on the **List of bones and bone parts – Appendicular**. This portion will be made up mostly of disarticulated bones.
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**For Lab Practical Exam #3 (5/29) you should know the following:**

## Muscles

- Know the names, locations, and general functions of all the muscles on the **list of muscles** found attached to the syllabus. You need to know the origins and insertions only for the muscles listed in **bold**
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**For Lab Practical Exam #4 (6/10) you should know the following**

## Brain and Cranial nerves

- Know the names and locations of the internal and external brain structures on the attached list
  - Know the 12 cranial nerves by name and by number and know their major functions
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# List of Bones and Bone Parts – Axial

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## Axial Skeleton

### 1. Skull

cranial bones - frontal, occipital, sphenoid, ethmoid, parietal, temporal

facial bones - mandible, vomer, maxilla, zygomatic, lacrimal, nasal, palatine, inferior nasal conchae

sutures - coronal, sagittal, squamous, lambdoid

sinuses - frontal, maxillary, sphenoidal, ethmoidal

processes - styloid, zygomatic, mastoid, palatine

foramina – foramen magnum, supraorbital foramen, infraorbital foramen, mental foramen, optic foramen, foramen ovale, foramen rotundum, jugular foramen

fontanelles - frontal (anterior), occipital (posterior), mastoid (posterolateral), sphenoidal (anteriolateral)

other structures - zygomatic arch, orbit, sella turcica, crista galli, cribriform plates, external auditory canal, condyler process of mandible, nasal septum (*and its constituents*), hard palate (*and its constituents*)

### 2. Vertebral column

types of vertebrae - cervical, atlas, axis, thoracic, lumbar, sacral, coccygeal

parts of a vertebra - body, spinous process, transverse process, inferior and superior articular processes, vertebral foramen, costal facets, intervertebral disc

### 3. Thorax

ribs - true, false, floating

parts of a rib – head (capitulum), neck, body, tubercle

parts of the sternum - manubrium, body, xiphoid process, clavicular articulation, jugular notch

### 4. Hyoid bone

hyoid bone – that's all, just the bone. Really.

# List of Bones and Bone Parts – Appendicular

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## Appendicular Skeleton (you will need to be able to distinguish a **right** bone from a **left** bone)

### 1. Shoulder girdle

parts of the scapula - spine, acromion process, glenoid fossa, supraspinous fossa, infraspinous fossa, subscapular fossa, coracoid process

parts of the clavicle - sternal end, body, acromial end

### 2. Upper appendages

parts of the humerus - head, neck, greater tubercle, lesser tubercle, lateral epicondyle, medial epicondyle, trochlea, capitulum, coronoid fossa, olecranon fossa, deltoid tuberosity

parts of the ulna - olecranon process, coronoid process, semilunar (trochlear) notch, radial notch, styloid process, head

parts of the radius - head, neck, radial tuberosity, styloid process, ulnar notch

types of carpals - scaphoid, lunate, triquetral (triangular), pisiform, trapezium, trapezoid, capitate, hamate

metacarpals - base (proximal), shaft, head (distal), and know the numbering

types and parts of the phalanges - proximal, middle, distal, pollex

### 3. Hip girdle

parts of the innominate bone - ilium, iliac crest, anterior superior iliac spine, (os coxae) posterior superior iliac spine, anterior inferior iliac spine, posterior inferior iliac spine, greater sciatic notch, ischial tuberosity, ischial ramus, lesser sciatic notch, pubis, acetabulum, obturator foramen, ischium, pubic symphysis, sacroiliac joint

### 4. Lower appendages

parts of the femur - head, neck, greater trochanter, lesser trochanter, lateral epicondyle, medial epicondyle, lateral condyle, medial condyle, intercondylar fossa, patellar surface

parts of the patella - base, apex, articular facets

parts of the tibia - lateral condyle, medial condyle, tibial tuberosity, intercondylar eminence, medial malleolus

parts of the fibula - head, neck, lateral malleolus

types of tarsals - calcaneus, talus, cuboid, navicular, first, second, and third (lateral, intermediate and medial) cuneiform

metatarsals - base (proximal), shaft, head (distal), and know the numbering

types and parts of the phalanges - proximal, middle, distal, hallus (hallux)

## List of Muscles

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Know the origin and insertion of all the muscles listed in **bold letters**.

### Head and Face

**occipitofrontalis**  
**orbicularis oculi**

corrugator supercillii  
orbicularis oris

### **buccinator**

depressor labii inferiorus  
levator labii superiorus  
zygomaticus

### **masseter**

temporalis

### Neck

platysma  
digastric

### **sternocleidomastoid**

*splenius capitus*

### Chest

**pectoralis major**  
**serratus anterior**

external intercostals  
internal intercostals  
diaphragm

### Abdominal Region

**rectus abdominus**

external oblique  
internal oblique  
transverse abdominus

### Back

trapezius

### **latissimus dorsi**

*splenius capitus*

### Shoulder

supraspinatus  
infraspinatus  
subscapularis  
teres major  
rhomboideus major  
levator scapulae

### **deltoid**

### Upper Arm

**biceps brachii**

brachialis

**triceps brachii**

*brachioradialis*

### Lower Arm

**flexor carpi radialis**

flexor carpi ulnaris

flexor digitorum superficialis

**extensor carpi ulnaris**

extensor digitorum

extensor carpi radialis

flexor pollicis longus

extensor pollicis longus

### Hip and Thigh

psoas major

iliacus

**gluteus maximus**

gluteus medius

*adductor longus*

### Upper Leg

**sartorius**

**quadriceps femoris**

rectus femoralis

vastus lateralis

vastus medialis

vastus intermedius

gracilis

adductor longus

“Hamstrings”

biceps femoris

semitendinosus

semimembranosus

### Lower Leg

tibialis anterior

extensor hallucis longus

extensor digitorum longus

fibularis (peroneus) longus

**gastrocnemius**

soleus

**flexor hallucis longus**

flexor digitorum longus

# Brain structures

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Locate on a diagram and describe the function of each of the following landmarks of the brain:

## External structures

cerebral hemispheres

cerebrum

midbrain

cerebellum

pons

medulla

central sulcus

precentral gyrus

postcentral gyrus

lateral sulcus

longitudinal fissure

frontal lobe

parietal lobe

occipital lobe

temporal lobe

12 cranial nerves:

I. Olfactory

II. Optic

III. Oculomotor

IV. Trochlear

V. Trigeminal

VI. Abducens

VII. Facial

VIII. Vestibulocochlear (aka. Auditory)

IX. Glossopharyngeal

X. Vagus

XI. Accessory (aka. Spinal Accessory)

XII. Hypoglossal

## Internal structures:

corpus callosum

basal ganglia (nucleus)

-caudate

-putamen

internal capsule

thalamus

hypothalamus

hippocampus

amygdala

pineal gland

pituitary gland

reticular formation

fornix

substantia nigra

cingulate gyrus

optic chiasm

lateral ventricles

mammillary bodies

corpora quadrigemina

-inferior colliculus

-superior colliculus