

VALENCIA COLLEGE COURSE LOGISTICS

COURSE SYLLABUS: BSC 2093C HUMAN ANATOMY AND PHYSIOLOGY 1

4 credit hours **6 contact hours/week**
Session 202410 **CRN# 17576**

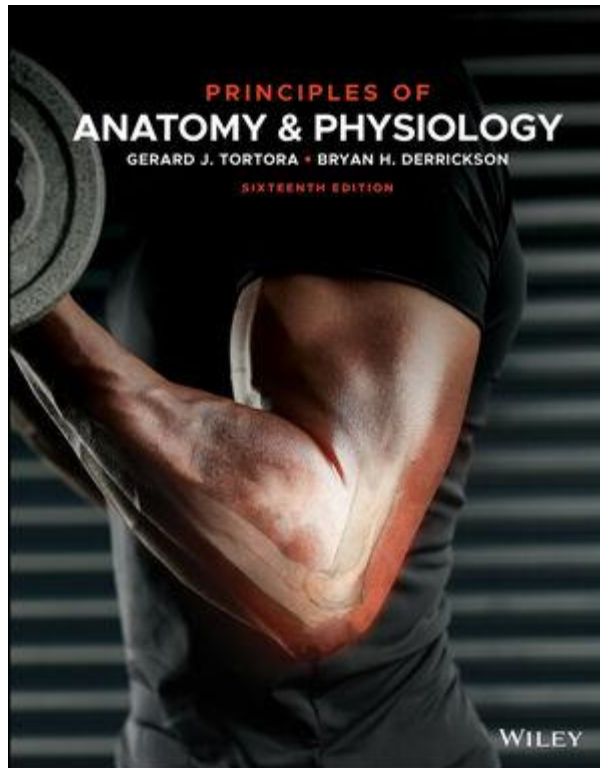
- Instructor:** **Dr. Marlene Gillies**
I believe all students can learn; therefore, it is my goal to support your learning; please know, I am here to assist you throughout the course
- Office:** **407-582-5156 or 407-582-5149; Science Office AHS 231**
(Note: This is the number for the main office (M-F), use for emergency contact and office personnel will reach me)
- E-mail:** mgillies@valenciacollege.edu
(Best method to reach me) I will respond within 24-48 hrs.
- Office Hours:** **Before class**
(Please contact me via email if you wish to schedule a meeting before class).
- Location/Time:** **Wednesdays 4:00pm-6:45pm WC-HSB 132**

COURSE DESCRIPTION:

BSC 2093C is the first part of the Human Anatomy and Physiology course. A systems approach will be used in the course meaning that both the anatomy and physiology of a system will be covered. Systems studied include:

- | | |
|-----------|------------------------------------|
| Ch. 1 | An Introduction to the Human Body |
| Ch. 2 | The Chemical Level of Organization |
| Ch. 3 | The Cellular Level of Organization |
| Ch. 4 | The Tissue Level of Organization |
| Ch. 5 | The Integumentary System (Skin) |
| Ch. 6-9 | The Skeletal System and Joints |
| Ch. 10-11 | The Muscular System |
| Ch. 12-17 | The Nervous System |
| Ch. 18 | The Endocrine System |

REQUIRED TEXTS:



The set of Principles of Anatomy & Physiology 16e with both loose-leaf text and WileyPLUS and the lab manual ISBN: 9781119829799 Publisher: Wiley

Power point slides, syllabus, course related materials and WileyPlus assignments are available through Canvas

Electronic device to be used for in class assessments

Long White Lab Coat
Closed toed footwear in the lab
No Food or Drink in the lab

GRADING POLICY: Point System

Final grade is based on **1500 POINTS**. Points earned come from various sources: (**Disclaimer: Point distribution subject to change**)

Task	Points
Exams Ch. 1-14	450
Final Exam Ch 15, 18 & cumulative	150
WileyPlus Assignments	300

Muscles in Motion	50
Reviewing Your Knowledge	150
Lab Quizzes	150
Chapter Assessments	200
Case Study Presentation	50

Exams are taken directly from the power points, notes, text, resources, class discussions and activities used throughout WileyPlus.

Exams are multiple format which may include multiple choice, multiple selections, matching, fill-in the blank, dropdown, drag and drop, and short responses.

All lab quizzes use material from the lab manual.

Quizzes: pay attention to diagrams, charts, pathways, figures, handouts and tables. Any of these forms may be used. (Structure, function, location)

Group Case Study Presentation

Students will work in pairs/groups, given critical thinking scenarios, conduct research and present to class

Lockdown Browser will be used for exams

GRADING SCALE:

Points	Percentage	Letter Grade
1350-1500	90 – 100%	A
1200-1349	80 – 89%	B
1050-1199	70 - 79%	C
900-1049	60 – 69%	D
0 - 899	0 - 59%	F

You must earn a grade of “C” or better in A&P I to be able to enroll in A & P II

GUIDELINES AND EXPECTATIONS:

1. The human body is quite complex. The pace of this course is rigorous, demanding and requires your full participation and effort.
2. **Regular attendance in lab is mandatory for satisfactory performance in this course.** Leaving early = absent. Your record of attendance may be used as a criterion for assigning a final grade in borderline cases. Please note, attendance record is kept and maintained and may be submitted to the registrar upon request. **Please note the college policy for withdrawal – instructor may withdraw student for multiple absences.**

3. It is mandatory to be present (submit assignment/physically present) to confirm your presence in class to ensure non-withdrawal for “No Show” in the course. No Show Period August 30-September 8, 2023. Attendance must be taken – this is also important as a part of student financial aid.
4. **Be on time!** Tardiness will not be tolerated. If you are absent when work is due, **it is late and will not be accepted unless there’s a valid reason.** It is your responsibility to get it to me by the due date.
5. Missed lab quiz equals zero (0) points. If you miss a lab quiz due to tardiness, you will have earned a zero (0) for that quiz.
6. **Reading assignments** (see course schedule). The e-text is available to support your reading whether to read for you, to highlight and or review. There is a plethora of resources available through WileyPlus; be mindful of time management and organization.

Complete lab questions and diagrams **prior to** the lab

The assignments and course materials are available through WileyPlus in Canvas. Please note there are **WEEKLY DUE DATES** on assignments, quizzes and exams (**See Canvas Calendar and Syllabus Schedule**). Please contact me via email if you fall behind in order for us to devise a plan to make sure that you can get caught up of missing work. No work more than one (1) week late will be accepted.

7. **Assessments:** You will have opportunities for practice assessment at the end of each chapter prior to the chapter exam through WileyPlus.

EXAMS will occur using RESPONDUS LOCKDOWN BROWSER

**Exams must be completed on the assigned due date.
Missed exams will earn a grade of zero (0)**

8. **Make –up Tests:**

There will be **NO** exam make-ups or due date extension unless I am notified **prior to the exam** or extraordinary circumstances develop accompanied by doctor’s note or emergency documents and only with my approval. If satisfactory arrangement is not made with me prior to the exam, a grade of zero (0) will be given.

- All test grades will count – the lowest grade **will not** be dropped under any circumstances.

- Medical excuses must be covered by a doctor's note.
9. To maintain privacy and confidentiality, grades will be discussed only between the student earning them and the instructor.
 10. Integrity and honesty are crucial especially in the health care arena as lives are at stake. Your upholding the integrity and honor of your chosen profession begins here as you journey towards your career as a member of your noble profession. Thus, academic dishonesty is not to occur and **will not** be tolerated. Cheating and/or plagiarism and/or disruption during class meetings can and will result in severe academic penalties which may include withdrawal from course, failure of exam/quiz and or course withdrawal with referral to the Academic Dean. *“Each student is required to follow Valencia policy regarding academic honesty. All work submitted by students is expected to be the result of the student’s individual thoughts, research, and self-expression unless the assignment specifically states ‘group project.’”* [Code of Conduct](#)
 11. Academic disputes – Students should try to contact the instructor to address concerns. Students are encouraged to contact the Academic Dean or Office of the Ombudsman if any unresolved conflicts arise. [Academic Dispute](#)

“Valencia College is committed to providing each student a quality educational experience. Faculty members have set high standards of instruction for themselves and for you. If you have a problem in a class, your first step is to talk to your instructor. If you are still dissatisfied, you may talk with the academic dean of the division for your class. We will work together to resolve any issues that arise.”
 12. College policy forbids children/pets (unless service animal) from attending lectures or labs.
 13. No food/drink in the lab.
 14. Electronic devices that emit audible sound should be placed on vibrate or silenced during lectures and labs. *Please put such devices on off or vibrate.* If an emergency situation requires your attention, please quietly remove yourself from the room. **Monitored electronic device allowed during testing using Lockdown browser.**
 15. FERPA- [FERPA](#)
 16. Title IX- [Title IX](#)

Drop/Refund deadline: August 28 2023 @ 11:59 p.m.

No Show Period: August 30 – September 8, 2023

WITHDRAWAL DEADLINE:

The date for WITHDRAWAL WITHOUT PENALTY is

October 27, 2023 @ 11:59 pm

PLEASE FAMILIARIZE YOURSELF WITH THE COLLEGE POLICY

Per the College Catalog:

“You may withdraw from a class or all of your classes after the end of the official Drop/Add period, but before the mid-session withdrawal deadline. However, you are not eligible for a refund. If you owe the college any money, you will still have to pay that balance. Refer to the college [VC Catalog](#) for further information.”

Note: Students on financial aid should consult an advisor or counselor before withdrawing from a course. There may be financial implications which they must know about to make an informed decision before withdrawing from a course.

Students with some scholarships who withdraw or are withdrawn from a class must pay the college for the cost of the class. Other scholarship sponsors may also require repayment.

See LifeMap for support [LifeMap](#)

Policy: The final exam is the culmination of your learning experience in the course. Please note, it is required that you are present for the final exam.

Policy: Students who are absent and do not take the final exam will receive a grade of “F”.

SUCCESS STRATEGIES:

Your success throughout the course is extremely important. As a guide:

- Make a schedule and set aside 10-12 hours weekly and be prepared (text, resources, notes)
- Organize your time, material and create a study plan
- There is a great deal of material to learn. **Study daily** (Set aside 2-3 hours/day for studying and practice).
- Form study groups or get a study-buddy when possible to compare notes, test each other etc.

- Seek help early
- WileyPlus has tutorials, quizzes, practice drills, flash cards, adaptive practice etc. (use what works best for you). **You do not have to use all the resources as it can be overwhelming**
- In addition to WileyPlus, there are many animations especially of the nervous system (NS) on sites such as YouTube
 - LifeMap – Students are encouraged to utilize LifeMap for resources and support.
 - Brainfuse Online tutoring service available through the college
 - Virtual Tutoring: [Virtual Tutoring](#)
 - Virtual Advising and Counseling: [Advising and Counseling](#)
- Valencia College offers a variety of Skillshops: short seminars covering a variety of topics which deal with student success, goals and purpose. To check out Valencia’s Skillshops offerings, go to: [Skillshops](#)
- **Email me for assistance/clarification/questions**
 - In these unprecedented times, the rigor of college courses; as well as; academic and nonacademic obligations may impart stress upon students. The college provides support and assistance through advisors and counselors. In the event of stress or feeling overwhelmed, please seek assistance and support through Student Services and or **Baycare Behavioral Health’s Student Assistance Program** (for private counseling).
 - *“Valencia is committed to making sure all our students have a rewarding and successful college experience. To that purpose, Valencia students can get immediate help that may assist them with psychological issues dealing with stress, anxiety, depression, adjustment difficulties, substance abuse, time management as well as relationship problems dealing with school, home or work. Students have 24-hour unlimited access to the **Baycare Behavioral Health’s confidential student assistance program** phone counseling services by calling **(800) 878-5470**. Three free confidential face-to-face counseling sessions are also available to students.”*

PLEASE DO NOT RECORD AND OR POST CLASS DISCUSSIONS, PROCEDURES, EXAMS, ETC ON THE INTERNET/SOCIAL MEDIA.

Please maintain etiquette and netiquette, be respectful and address everyone in the course with the utmost respect. During discussions, class meeting or interactions, the Peace and Justice Principles will be instituted ([PJI Principles](#) please listen intently, and allow others to express views even if differ from yours). **Discussions should be focused on topics directly related to our course only.**

VALENCIA STUDENT CORE COMPETENCIES:

The faculty of Valencia College has identified four core competencies that define the learning outcomes for a successful Valencia graduate. These competencies are at the heart of the Valencia experience and provide the context for learning and assessment at Valencia College. You will be given opportunities to develop and practice these competencies in this class.

This course will reinforce the following competencies:

THINK

Clearly, critically and creatively
Analyze, synthesize, integrate and evaluate in many domains of human inquiry.

VALUE

Make reasoned value judgments and responsible commitments.

COMMUNICATE

Communicate with different audiences using varied means.

ACT

Act purposefully, reflectively and responsibly.

STUDENTS WITH DISABILITIES:

Students with disabilities who qualify for academic accommodations **MUST** provide the professor with a letter from the Office of Students with Disabilities at the **start** of the term. The Office of Students with Disabilities determines accommodations based on appropriate documentation of disabilities.
West Campus SSB, Rm. 102 Phone: 407-582-1523 Fax: 407-582-1326

SECURITY STATEMENT

Please maintain confidentiality of personal information securely. Do not share yours or any personal or private information online, via social media or via any other means.

Disclaimer:

Syllabus and/or course schedule may be altered at the discretion of the instructor.

COURSE SCHEDULE BSC 2093C ANATOMY AND PHYSIOLOGY I CRN# 17576		
Assignments online Labs: WC-HSB 132 (Wednesdays)		
Date	Activities	EXAM/Quiz Assessment Due Date
Week of 8/21/23- 8/26/23	Syllabus Review Review WileyPlus How to... Read Ch.1 & 2 Complete Ch.1 & 2 WileyPlus assignments Lab Exercises 1-3	Assessment Ch. 1 & 2 8/26/23 Syllabus Quiz 8/23/23 Exam Ch. 1 & 2 (8/30/23)
8/28/23- 9/02/23	Read Ch. 3 & 4 Complete Ch.3 & 4 WileyPlus assignments Labs 4-6	Assessment Ch. 3 & 4 9/2/23 Exam Ch. 3 (9/6/23)
09/04/23	College Holiday – Labor Day	
9/5/23- 9/09/23	Read Ch. 5 Complete Ch. 5 WileyPlus assignments Labs 6-7	Assessment Ch. 5 9/9//23 Exam Ch. 4 & 5 (9/13/23)
9/11/23- 9/16/23	Read Ch. 6 Complete Ch. 6 WileyPlus assignments Lab 8	Assessment Ch. 6 9/16/23 Exam Ch. 6 (9/20/23)
9/18/23- 9/23/23	Read Ch.7 Complete Ch. 7 WileyPlus assignments Lab 9	Assessment Ch. 7 9/23/23
9/25/23- 9/30/23	Read Ch. 8 Complete Ch. 8 WileyPlus assignments Lab 10	Assessment Ch. 8 9/30//23 Lab Quiz #1 9/27/23 (Labs1-10) Reviewing Your Knowledge 1-10 Exam Ch. 7 & 8 (10/4/23)
10/02/23- 10/07/23	Read Ch. 10 Complete Ch. 10 WileyPlus assignments Labs 12 & 13	Assessment Ch. 10 10/7/23
10/09/23- 10/14/23	Read Ch. 11 Complete Ch.11 WileyPlus	Assessment Ch. 11 10/14/23

	assignments Labs 14 & 15	Exam Ch. 10 & 11 (10/18/23)
10/16/23- 10/21/23	Read Ch. 12 Complete Ch. 12 WileyPlus assignments Labs 16	Assessment Ch. 12 10/21/23 Exam Ch. 12 (10/25/23)
10/23/23- 10/28/23	Read Ch. 13 Complete Ch. 13 WileyPlus assignments Lab 17 - 19	Assessment Ch. 13 10/28/23 Exam Ch. 13 (11/01/23)
10/30/22- 11/04/23	Read Ch. 14 Complete Ch. 14 WileyPlus assignments Labs 20-21	Assessment Ch. 14 11/4/23 Exam Ch. 14 (11/8/23)
11/06/23- 11/11/23	Read Ch. 15 Complete Ch. 15 WileyPlus assignments Lab 22	Assessment Ch. 15 11/11/23
11/13/23- 11/18/23	Read Ch. 16 Complete Ch. 16 WileyPlus assignments Lab 23	Assessment Ch. 16 11/18/23 Reviewing Your Knowledge [Labs 12, 14, 16-19, 20-21] Lab Quiz #2 (11/15/23)
11/20/23- 11/26/23	Thanksgiving Holiday	
11/27/23- 12/02/23	Read Ch. 18 Complete Ch. 18 WileyPlus assignments Lab 25	Assessment Ch. 18 12/2/23
12/6/23-	FINAL EXAM –COMPREHENSIVE WITH MAIN FOCUS CH 15, 16 AND 18	

Active Learning Activities/Lecture may continue in lab to complete chapters

Valencia College A&PII Course Outcome

BSC 2093C is the first part of the Human Anatomy and Physiology course. A systems approach will be used in the course meaning that both the anatomy and physiology of a system will be covered. Concepts studied include: Scientific method, biochemical processes of life, cells, tissues, structure and function of integumentary, skeletal, muscular, and endocrine and nervous systems, and organs of special senses. Lab exercises emphasize anatomic and physiologic principles associated with classroom work.

This course meets the General Education science requirement for graduation.

Chapter 1 – Detailed Learning Outcomes

Students will identify, define, and/or analyze:

anatomy and physiology

overview of the 11 systems of the human body: major components and functions of each

body fluids: intracellular fluid, extracellular fluid, interstitial fluid

homeostasis

negative and positive feedback system, and an example of each

steps/components of feedback systems: controlled condition, stimulus, receptor, control center, effector

body positions: anatomical position, supine, prone

directional terminology: superior (cephalic or cranial), inferior (caudal), anterior (ventral), posterior (dorsal), medial, lateral, intermediate, ipsilateral, contralateral, proximal, distal, superficial (external), deep (internal)

planes and sections: sagittal, midsagittal, parasagittal, frontal (coronal), transverse (cross-sectional, horizontal), oblique

regional names in anterior and posterior views

cavities: cranial, thoracic, (pericardial, pleural, mediastinum), abdominopelvic

membranes: visceral and parietal pericardium, visceral and parietal pleura, visceral and parietal peritoneum

9 abdominopelvic regions: right hypochondriac, epigastric, left hypochondriac, right lateral (lumbar), umbilical, left lateral (lumbar), right inguinal (iliac), hypogastric (pubic), left inguinal (iliac)

4 abdominopelvic quadrants: right upper, right lower, left upper, left lower

Chapter 2 – Detailed Learning Outcomes

Students will identify, define, and/or analyze:

chemistry and chemical elements

atoms and their components: protons, neutrons, and electrons

isotopes and half lives

atomic number and mass number and atomic mass units

molecules and molecular formulas and compounds

covalent bonds: single, double, triple, nonpolar, polar

ions: cations, anions, ionic bonds, electrolytes

hydrogen bonds

chemical reactions: metabolism, exergonic reactions, endergonic reactions, activation energy, catalysts, synthesis reactions, anabolism, decomposition reactions, catabolism, exchange reactions

solutions: solutes and solvents

concentration: percentage (grams of X / 100 ml of solution), molarity (moles of X / 1000 ml of solution), moles

hydrophilic and hydrophobic molecules (and regions within molecules)

dehydration synthesis and hydrolysis reactions

mixtures and colloids and suspensions

acids and bases and pH scale, salts, and buffers

organic compounds: carbon skeletons and functional groups

macromolecules and polymers

isomers

carbohydrates: monosaccharides, disaccharides, polysaccharides

lipids: triglycerides, fatty acids (saturated and unsaturated), phospholipids, steroids, lipoproteins

proteins: amino acids, peptide bonds, polypeptides, primary structure, secondary structure, tertiary structure, quaternary structure

enzymes: apoenzymes, cofactors, coenzymes, substrates, denaturation

nucleic acids: DNA, RNA, nucleotides (A, T, G, C and U)

ATP and its role in metabolism

Chapter 3 – Detailed Learning Outcomes

Students will identify, define, and/or analyze:

major cellular components: plasma membrane, nucleus, cytoplasm (cytosol and organelles)

fluid mosaic model of the membrane: lipid bilayer, phospholipids, amphipathic molecules, integral proteins, peripheral proteins, glycocalyx, membrane fluidity, self-repairing nature of membrane, factors increasing or decreasing fluidity

membrane permeability

membrane potential

movement across membranes: diffusion, passive transport, facilitated diffusion, active transport (primary and secondary), antiporters and symporters

osmosis and movement of water between cells and various solutions (isotonic solution, hypotonic solution, hypertonic solution)

exocytosis and endocytosis (receptor mediated endocytosis and phagocytosis and pinocytosis) and transcytosis

cytoskeleton elements and cell structures: microfilaments and microvilli, intermediate filaments, microtubules and centrosomes, cilia, and flagella

organelles: endoplasmic reticulum (ER) – smooth and rough – ribosomes, golgi complex, lysosomes, mitochondria, nucleus, and nucleolus

chromosomes: chromatids, genes, and genome

DNA replication

transcription: RNA polymerase, promoter, terminator, introns, and exons

translation: tRNA, codons, anticodons, polyribosomes

genetic engineering and recombinant DNA

mitosis and meiosis

cell cycle: interphase, prophase, metaphase, anaphase, telophase

apoptosis and necrosis

Chapter 4 – Detailed Learning Outcomes

Students will identify, define, and/or analyze:

ectoderm, mesoderm, and endoderm, and the tissues and organs that arise from them

cell-to-cell junctions: tight junctions, adherens junctions, desmosomes, hemidesmosomes, and gap junctions

cell surfaces: apical, lateral, basal

basement membrane

epithelial tissues: simple squamous epithelium, simple cuboidal epithelium, simple columnar epithelium, stratified squamous epithelium (keratinized and nonkeratinized), stratified cuboidal epithelium, stratified columnar epithelium, transitional epithelium, pseudostratified columnar epithelium

glands: endocrine, exocrine, simple, compound (tubular, acinar, tubuloacinar), merocrine, apocrine, holocrine

cells: goblet cells, fibroblasts, chondroblasts, chondrocytes, osteoblasts, osteocytes, macrophages, plasma cells, mast cells, adipocytes, neutrophils, eosinophils

matrix elements: ground substance, collagen fibers, elastic fibers, reticular fibers, lacunae

connective tissues: mesenchyme, areolar connective tissue, adipose (white and brown), reticular connective tissue, dense regular connective tissue, dense irregular connective tissue, elastic connective tissue, hyaline cartilage, fibrocartilage, elastic cartilage

membranes: mucous, serous (visceral and parietal layers), synovial

stem cells

stroma and parenchyma and repairs by parenchymal cells vs. repairs by stromal fibroblasts

Chapter 5 – Detailed Learning Outcomes

Students will identify, define, and/or analyze:

epidermis, dermis, hypodermis (subcutaneous layer)

epidermal cells: keratinocytes, melanocytes, Langerhans cells, Merckel cells

epidermal layers: stratum basale, stratum spinosum, stratum granulosum, stratum lucidum, stratum corneum

papillary region of dermis: Meissner corpuscles, free nerve endings, capillaries

reticular region of dermis: hair follicles, sebaceous (oil) glands, sudoriferous glands (sweat glands), lamellated (Pacinian) corpuscles, arrector pili, hair root plexuses

skin pigments: melanin, carotene, hemoglobin, bilirubin

thick skin and thin skin

hair: hair follicles, hair root plexuses, arrector pili, growth stage and resting stage, hirsutism

glands: sebaceous (oil) glands, eccrine sweat glands, apocrine sweat glands, ceruminous glands

nails: lunula, hyponychium, eponychium (cuticle)

functions of skin: thermoregulation, protection, cutaneous sensation, excretion and absorption, synthesis of vitamin D

skin repair

Chapter 6 – Detailed Learning Outcomes

Students will identify, define, and/or analyze:

bone regions: diaphysis, epiphyses, and metaphysis

periosteum and endosteum

medullary cavity (marrow cavity)

cells: osteogenic cells, osteoblasts, osteocytes, osteoclasts

compact bone and spongy bone

bone structural elements: osteons (Haversian systems), perforating (Volkmann's) canals, central (Haversian) canals, lamellae, lacunae, canaliculi, trabeculae

ossification (intramembranous and endochondral) and osteogenesis, interstitial growth, appositional growth, primary and secondary ossification centers, epiphyseal plates

bone remodeling and bone resorption and effects of disuse and stress on bone mass

dangers associated with abnormal blood calcium levels

regulation of blood calcium levels via parathyroid hormone and calcitonin, via bone osteoclast and osteoblast activity, via urinary calcium loss rates, via gastrointestinal absorption rates

Chapter 7 – Detailed Learning Outcomes

Students will identify, define, and/or analyze:

cranial bones: frontal bone, parietal bones, occipital bone, sphenoid bone, ethmoid bone

sutures and fontanels: coronal suture, sagittal suture, lambdoid suture, squamous suture, anterior fontanel (*alternative spelling = anterior fontanelle*), posterior fontanel (*alternative spelling = posterior fontanelle*)

features of the cranial bones:

frontal bone: frontal sinus

temporal bone: zygomatic process, mandibular fossa, articular tubercle, mastoid process, external auditory meatus, styloid process

occipital bone: foramen magnum, occipital condyle, superior nuchal line, inferior nuchal line

sphenoid bone: sella turcica, sphenoid sinus, superior orbital fissure, optic foramen

ethmoid bone: perpendicular plate, cribriform plate, olfactory foramina, crista galli, nasal conchae (*superior & middle*)

facial bones: nasal bone, maxilla, zygomatic bone, lacrimal bone, palatine bone, nasal concha (*inferior*), vomer, mandible, hyoid bone

features of the facial bones:

maxilla: palatine process, inferior orbital fissure

zygomatic bone: temporal process

mandible: body, ramus, angle, condylar process, coronoid process, mandibular notch

vertebral column: cervical vertebra (C1-C7) (C1=atlas, C2=axis), thoracic vertebra (T1-T12), lumbar vertebra (L1-L5), sacrum (with anterior and posterior sacral foramina), coccyx

cervical, thoracic, and lumbar vertebrae - what are the differences between them?

vertebrae: body, pedicle, lamina, vertebral foramen, transverse process, spinous process, superior articular process, inferior articular process, intervertebral foramen, transverse foramen

intervertebral disc: annulus fibrosus and nucleus pulposus

articulations between ribs and vertebrae: transverse processes of vertebrae articulate with tubercles of ribs, bodies of vertebrae articulate with heads of ribs

sternum: manubrium, body, xiphoid process

ribs 1-12: head, neck, tubercle, body

Chapter 8 – Detailed Learning Outcomes

Students will identify, define, and/or analyze:

bones of shoulder girdle and upper limb:

clavicle, scapula, humerus, ulna, radius, carpals, metacarpals, phalanges

joints of shoulder girdle and upper limb:

acromioclavicular joint, sternoclavicular joint, glenohumeral joint, proximal radioulnar joint, interosseous membrane, distal radioulnar joint, radiocarpal joint, intercarpal joints, carpometacarpal joints, metacarpophalangeal joints, interphalangeal joints

features of bones of shoulder girdle and upper limb:

scapula: acromion, coracoid process, glenoid cavity, spine, supraspinous fossa
humerus: head, lesser tubercle, greater tubercle, intertubercular sulcus, deltoid tuberosity,
lateral epicondyle, medial epicondyle
ulna: coronoid process, olecranon
radius: head, neck, radial tuberosity, styloid process
metacarpals: base, shaft, head
phalanges: proximal phalanges, middle phalanges, distal phalanges

[NOTE: features to be studied should include those which students will need to know as origins and insertions of the muscles that they will be expected to learn in chapter 11]

bones of hip girdle and lower limb: coxal (hip or pelvic) bone, sacrum (with ilium, ischium, and pubis), femur, patella, tibia, fibula, tarsals (including calcaneus, talus, and navicular), metatarsals, phalanges

false pelvis and true pelvis

male and female pelvis – how are they different?

joints of the pelvic girdle and lower limb:

sacroiliac joints, pubic symphysis, tibiofemoral joint, proximal tibiofibular joint, interosseous membrane, distal tibiofibular joint, talocrural joint, intertarsal joints, tarsometatarsal joints, metatarsophalangeal joints, interphalangeal joints

features of bones of the pelvic girdle and lower limb:

ilium: acetabulum (also part of ischium and pubis), iliac crest, iliac fossa
ischium: ischial spine, ischial tuberosity
femur: head, neck, greater trochanter, lesser trochanter, linea aspera, medial condyle, lateral condyle
tibia: lateral condyle, medial condyle, tibial tuberosity
metatarsals: base, shaft, head
phalanges: proximal phalanges, middle phalanges, distal phalanges

[NOTE: features to be studied should include those which students will need to know as origins and insertions of the muscles that they will be expected to learn in chapter 11]

Chapter 9 – Detailed Learning Outcomes

Students will identify, define, and/or analyze:

types of joints: suture, syndesmosis (ligaments and interosseous membranes), gomphosis, synchondrosis, symphysis, synovial joint

components of joints: articular cartilage, articular capsule, synovial membrane, synovial fluid, articular disc or meniscus, bursa

types of synovial joints: planar joints, hinge joints, pivot joints, condyloid joints, saddle joints, ball-and-socket joints

motions that occur at joints: flexion, extension, hyperextension, lateral flexion, abduction, adduction, circumduction, rotation, internal rotation (medial rotation), external rotation (lateral rotation), elevation, depression, protraction, retraction, inversion, eversion, dorsiflexion, plantar flexion, supination, pronation, opposition

range of motion -- and factors that cause range of motion to vary from person to person (and when comparing the right and left side of the body in healthy and injured individuals)

Chapter 10 – Detailed Learning Outcomes

Students will identify, define, and/or analyze:

types of muscle tissue and the major characteristics of each: skeletal muscle, cardiac muscle, and smooth muscle

superficial and deep fascia, tendons, and aponeuroses

muscle cells (muscle fibers), myoblasts, and satellite cells

structure and function of muscle cell features: neuromuscular junction (NMJ), synapse, synaptic cleft, neurotransmitter, synaptic end bulb, synaptic vesicle, acetylcholine, acetylcholine receptor, motor end plate, sarcolemma, T (transverse) tubule, glycogen, myoglobin, sarcoplasmic reticulum (SR), myofibril, thick filament, thin filament, Z disc, sarcomere, myosin, actin, tropomyosin, troponin

events that occur to cause excitation and contraction: release of acetylcholine, opening of channels in motor end plate, muscle action potential propagation, calcium release from sarcoplasmic reticulum (SR), calcium ions binding to troponin, tropomyosin shape change uncovering myosin binding sites, myosin head hydrolyzing ATP and becoming reoriented & energized, myosin head binding to actin, myosin head movement causing thin and thick filaments to slide past each other, myosin head detaching from actin

muscular atrophy and hypertrophy

length tension relationship

sources for ATP production in muscle fibers: creatine phosphate (1 ATP / creatine phosphate), anaerobic cellular respiration (2 ATP / glucose), aerobic cellular respiration (36 ATP / glucose)

motor units: small and large motor units, motor unit recruitment

myograms and contractions of muscle cells in motor units: twitch contraction, refractory period, wave summation, unfused tetanus, fused tetanus

muscle tone

isotonic and isometric contractions

characteristics of various types of muscle cells: slow oxidative (SO) fibers, fast glycolytic (FG) fibers, fast oxidative-glycolytic (FOG) fibers

skeletal muscle characteristics: striations (sarcomeres), multiple nuclei in very long cell, voluntary control

cardiac muscle contrasted with skeletal muscle – including auto rhythmicity, involuntary control, presence of intercalated discs, central nuclei, branching cells, and longer contractions in response to one action potential

smooth muscle compared with skeletal muscle – including involuntary control, lack of striations (sarcomeres), function of dense bodies, longer contractions in response to one action potential, spindle shape, central nucleus

visceral (single-unit) smooth muscle and multi-unit smooth muscle

growth of skeletal muscles after birth (hypertrophy, NOT hyperplasia)

muscle damage repair by satellite cells versus fibrosis

Chapter 11 – Detailed Learning Outcomes

Students will identify, define, and/or analyze:

muscle components: origin, insertion, and belly

mechanical advantage and mechanical disadvantage

relationship between muscle length and range of motion
relationship between muscle cross-sectional area and power

muscle roles: agonist (prime mover), antagonist, synergist, fixator

Specific muscles to be selected by the instructor to match what they intend to emphasize in lecture, lab, and quizzes.

For each muscle selected by the instructor include the appearance (in a photo or drawing), name, origin(s), insertion(s), and action(s).

In chapters 7 and 8 (the skeleton), the instructor should also be sure to select and emphasize the associated bony features that students will study again in chapter 11 - as being the origins and insertions of the selected muscles.

An example of selected muscles that might be chosen by the instructor:
(This sample list emphasizes muscles causing motion at the shoulder, elbow and forearm, hip, and knee.)

MUSCLES CAUSING MOTION AT THE SHOULDER

deltoid
coracobrachialis
latissimus dorsi
teres major
supraspinatus
pectoralis major

MUSCLES CAUSING MOTION AT THE ELBOW AND FOREARM

triceps brachii
brachialis
biceps brachii
supinator
pronator teres
pronator quadratus

MUSCLES CAUSING MOTION AT THE HIP

gluteus maximus
psoas major
iliacus
adductor longus
gluteus medius

MUSCLES CAUSING MOTION AT THE KNEE

HAMSTRINGS
semimembranosus
semitendinosus
biceps femoris

QUADRICEPS FEMORIS

rectus femoris
vastus medialis
vastus lateralis
vastus intermedius

Chapter 12 – Detailed Learning Outcomes

Students will identify, define, and/or analyze:

central nervous system (CNS): brain, spinal cord

peripheral nervous system (PNS): cranial nerves, spinal nerves, nerves, ganglia, enteric plexus

sensory, integrative, and motor functions of nervous system

types of neurons: sensory (afferent) neurons, interneurons, motor (efferent) neurons

multipolar neurons, bipolar neurons, unipolar neurons

parts of neurons (structure and function): cell body, dendrites, axon, synapses, synaptic vesicles, neurotransmitters

slow and fast axonal transport

somatic nervous system: types of receptors, types of effectors, voluntary control

autonomic nervous system: types of receptors, types of effectors, involuntary control

neuroglia: astrocytes, oligodendrocytes, microglia, ependymal cells, Schwann cells, satellite cells

myelin sheath and nodes of Ranvier

white matter, gray matter, gray matter nuclei

resting membrane potentials, hyperpolarizing graded potentials, depolarizing graded potentials, action potentials, refractory period, continuous conduction, saltatory conduction

ligand-gated channels, voltage gated (sodium and potassium) channels, sodium-potassium pump

chemical synapses and electrical synapses

excitatory postsynaptic potentials (EPSPs) and inhibitory postsynaptic potentials (IPSPs)

spatial and temporal summation

Chapter 13 – Detailed Learning Outcomes

Students will identify, define, and/or analyze:

spinal cord

meninges: pia mater, arachnoid mater, dura mater

spaces: subarachnoid space, subdural space, epidural space

the spinal cord extends to L2 (adults)

31 pairs of spinal nerves: anterior (ventral) roots, posterior (dorsal) roots, posterior (dorsal) root ganglia, cauda equina

spinal cord nuclei, anterior (ventral) gray horns, posterior (dorsal) gray horns, motor nuclei, and sensory nuclei

sensory (ascending) tracts, and motor (descending) tracts

reflexes: spinal reflexes, cranial reflexes, somatic reflexes, autonomic (visceral) reflexes, stretch (deep tendon) reflexes

reflex arc: sensory receptor, sensory neuron, integrating center, motor neuron, effector, muscle spindles

posterior (dorsal) rami, and anterior (ventral) rami

cervical plexus, phrenic nerve, brachial plexus, lumbar plexus, sacral plexus, sciatic nerve, intercostal (thoracic) nerves

dermatomes

Chapter 14 – Detailed Learning Outcomes

Students will identify, define, and/or analyze:

brain blood flow, blood brain barrier

CSF production, circulation, reabsorption, hydrocephalus

lateral ventricles, third ventricle, fourth ventricle, choroid plexus, arachnoid villus

brainstem structures and functions: medulla oblongata, pons, midbrain

brain structures and functions: cerebellum, thalamus, hypothalamus, limbic system, basal ganglia, left and right cerebral hemispheres, corpus callosum, cerebral cortex, gyri, sulci, fissures, longitudinal fissure, central sulcus, precentral gyrus, postcentral gyrus, frontal lobe, parietal lobe, temporal lobe, occipital lobe, association areas, premotor area, somatosensory association area

cranial nerves and functions:

CNI – olfactory nerve

CNII – optic nerve

CNIII – oculomotor nerve
CNIV – trochlear nerve
CNV – trigeminal nerve
CNVI – abducens nerve
CNVII – facial nerve
CNVIII – vestibulocochlear nerve
CNIX – glossopharyngeal nerve
CNX – vagus nerve
CNXI – accessory nerve
CNXII – hypoglossal nerve

Chapter 15 – Detailed Learning Outcomes

Students will identify, define, and/or analyze:

somatic and autonomic motor neurons

preganglionic neurons and postganglionic neurons

cholinergic neurons releasing acetylcholine
cholinergic receptors: nicotinic and muscarinic receptors

adrenergic neurons releasing norepinephrine
adrenergic receptors: alpha (α) and beta (β) receptors

sympathetic NS

“fight or flight” functions
thoracolumbar division / outflow (T1-12, L1-2)
vertebral chain (sympathetic trunk or paravertebral) ganglia
prevertebral (collateral) ganglia

parasympathetic NS

“rest and digest” functions
craniosacral division / outflow (S2-4, brainstem)
terminal (intramural) ganglia

autonomic plexuses

agonists and antagonists

role of hypothalamus in regulating balance between sympathetic tone & parasympathetic tone

effect of sympathetic stimulation on:

heart
respiratory system
digestive system
urinary system

pupil dilation

effect of parasympathetic stimulation on:

heart

respiratory system

digestive system

urinary system

pupil constriction

reproductive system

Chapter 16 – Detailed Learning Outcomes

Students will identify, define, and/or analyze:

referred pain

proprioceptive sensations and receptors: muscle spindles, tendon organs, joint kinesthetic receptors

primary somatosensory area (postcentral gyrus)

primary motor area (precentral gyrus)

the right cerebral hemisphere communicates with the left side of the body

the left cerebral hemisphere communicates with the right side of the body

relationship between size of regions within primary somatosensory area and density of sensory receptors

relationship between size of regions within primary motor area and density of motor units

somatic sensory pathways: first order neuron, second order neuron, third order neuron

somatic motor pathways: upper motor neuron (UMN), lower motor neuron (LMN)

specific sensory pathways:

posterior column

lateral spinothalamic

anterior spinothalamic

anterior and posterior spinocerebellar

specific motor pathways:

lateral corticospinal

anterior corticospinal

corticobulbar

Chapter 17 – Detailed Learning Outcomes

Students will identify, define, and/or analyze:

OLFACTION

olfactory epithelium with olfactory receptors
CN I = olfactory nerve

GUSTATION

taste buds with gustatory receptors
papillae: vallate, fungiform, filiform

VISION

upper eyelid (upper palpebra), lower eyelid (lower palpebra), palpebral conjunctiva, bulbar conjunctiva, lacrimal glands, lacrimal sac, cornea, sclera, ciliary body, ciliary muscle, iris, pupil, retina, optic disc, central fovea, blind spot, lens, anterior chamber, posterior chamber, aqueous humor, vitreous chamber, vitreous body

photoreceptors: rods and cones, rhodopsin, cis-retinal, trans-retinal, cone pigments

the sequence of events that make vision possible

HEARING

auricle (pinna), external auditory canal, eardrum (tympanic membrane), middle ear, auditory ossicles: malleus (hammer), incus (anvil), stapes (stirrup), eustachian tube, inner ear, cochlea, basilar membrane, spiral organ (organ of Corti)

sound waves:

frequency – pitch – measured in Hertz (Hz)

size or amplitude – intensity – measured in decibels (dB)

the sequence of events that make hearing possible

EQUILIBRIUM

static equilibrium and dynamic equilibrium

vestibular apparatus: utricle, saccule, semicircular canals, ampullae, maculae, cristae

Chapter 18 – Detailed Learning Outcomes

Students will identify, define, and/or analyze:

up regulation and down regulation

circulating hormones and local hormones, paracrine cells, and autocrine cells

mechanism for how lipid-soluble hormones travel to target cells and change activity in the target cells

mechanism for how water-soluble hormones travel to target cells and change activity in the target cells

hormone interactions: permissive effect, synergistic effect, antagonistic effect

specific endocrine glands (location in the body, hormones they produce, effects of the hormones they produce)

ANTERIOR PITUITARY GLAND

hGH – human growth hormone (somatotropin)

TSH – thyroid stimulating hormone (thyrotropin)

FSH – follicle stimulating hormone

LH – luteinizing hormone

PRL – prolactin

ACTH – adrenocorticotropic hormone (corticotropin)

POSTERIOR PITUITARY GLAND

OT – oxytocin

ADH – antidiuretic hormone (vasopressin)

THYROID

thyroid hormones: T₄ (thyroxine) and T₃ (triiodothyronine)

calcitonin

PARATHYROID GLANDS

PTH – parathyroid hormone (parathormone)

CORTEX of ADRENAL GLAND

MINERALOCORTICOIDS: aldosterone

GLUCOCORTICOIDS: cortisol, corticosterone, cortisone

ANDROGENS: testosterone, dehydroepiandrosterone (DHEA)

MEDULLA of ADRENAL GLAND

epinephrine (adrenalin) and norepinephrine (noradrenalin)

PANCREAS – PANCREATIC ISLETS – ISLETS OF LANGERHANS

glucagon

insulin

somatostatin

pancreatic polypeptide

TESTES (TESTICLES)

testosterone

OVARIES

estrogen (estradiol & estrone)

progesterone

PINEAL GLAND

melatonin

THYMUS

thymosin, thymic humoral factor (THF), thymic factor (TF), thymopoietin