Anatomy and Physiology Content Overview
D Block Final = Tuesday May 23, 2017

The format of the exam is fill-ins, matching, and multiple choice. You will have an alphabetical word banks for the fill-in portion, however the exam is timed so study your diagrams!

The lists below provide an overview of topics. It is your responsibility to read over your notes, taking any additional notes on this study guide. Refer to your workbook, your handouts, and past tests to review the topics. You should plan on 5-6 hours to prepare for this final, reviewing 30 min per system. Study over the course of a few days so you do not overwhelm yourself.

Your anatomy homework for this coming week, May 15-22 is to prepare yourself for the final.

For each system ask yourself the following questions:
1. What are the primary functions of the system?
2. What are the organs of this system?
3. What is the function of each organ? How does the structure of the organs (its tissue layers and special structures) help support its function?
4. Are there accessory organs involved in the system?
   a. If yes, what does each accessory organ help with?
5. How is the system and its organs controlled and regulated? (identify the stimulus and response)
6. How does the system/organ help maintain homeostasis (healthy internal balance) for the body?

Exam Content includes:
All body systems (Ch 1- Introduction, Ch 3 Part II - Tissues, Chapters 4-16 – Body Systems)
Naming organs, tissue layers, internal structures and functional units
Details on how organs function – stimulus/organ response
Details on how functional units work
Control mechanisms (negative feedback, hormones, neurotransmitters, external stimuli)
System pathways (nerves, hormones, digestive alimentary canal, urinary, blood vessels, etc.)

Introduction to Body Systems (Ch 1)
Primary Functions of all systems
Homeostasis
Body Cavities
Levels of Organization
[atom, macromolecule, organelle, cell, tissue, organ, system, organism]
Tissues (Ch. 3 Part II)
Tissue types (connective, muscle, epithelial, nervous) and function of each
Simple, stratified, pseudostratified, squamous, columnar, cuboidal, transitional epithelial tissue
Dense, loose, fibrous connective tissue
Yellow vs. white connective tissue
Collagen & elastin fibers
Smooth, skeletal, cardiac muscle tissue
Nervous tissue (neuron & neuroglia)

Tissue Images:

A

B

C

D

E
Integumentary System (Ch 4)
Label skin cross-section
Membranes found in integument system (serous, mucous, synovial, cutaneous)
Epithelial tissue types
Functions of skin
Skin features – color, sweat
Apocrine vs. eccrine sweat
Heat loss
Water loss
Cuts, injury inflammation, and the healing process
Keratinization
Skeletal System (Ch 5)
Identify major bones
Identify internal bone structures
Bone cells (osteocyte, osteoblast, osteoclast)
Functions of bone
Joint movement (joint types, range of motion))
Growth and healing
Endochondral bone
Intramembranous bone
Fractures
**Muscular System** (Ch 6)

Label Major Muscles

Function of muscles (movement, heat)

Muscle Tissue (smooth, cardiac, skeletal – know examples)

Actin and Myosin

Sarcomere

Sliding Filament Theory

Neuromuscular Junction – how is a muscle stimulated to contract?

Muscle Pairing
Nervous System (Ch 7)
Label the central nervous system
Functional Unit: Neuron – Label and know how it works
Function of cerebrum, cerebellum, brainstem, spinal cord
Compare and contrast the central nervous system with the peripheral nervous system
Nerve Pathway
Reflex Arc
Nerve Impulse
Special Senses (Ch 8 Part I: Eye and Vision)
Label the eye
Function of eye structures
Pathway of light through eye to retina
20:20 Vision
Vision problems (myopia, hyperopia, astigmatism)
Endocrine System (Ch 9)
Label glands
Role and function of each gland in maintaining homeostasis
Key hormones: (what secretes it; what is its target tissue; what affect does it have)
- Epinephrine
- Insulin
- Glucagon
- Calcitonin
- Parathyroid hormone
- Thyroid-stimulating hormone (TSH)
- Luteinizing hormone (LH)
- Follicle-stimulating hormone (FSH)
- Growth hormone (GH)
- Progesterone
- Testosterone
- Estrogen
- Prolactin
**Blood (Ch 10)**
Blood components (plasma, red blood cells (erythrocytes), white blood cells (leukocytes), platelets)
Blood Types (ABO, Rh+/-)
Universal Donor
Universal Recipient

**Cardiovascular System (Ch 11)**
Label Heart
Circulatory Pathway – Blood flow
Blood vessels (arteries, veins, capillaries)
**Lymphatic System and Body Defenses (Ch 12)**

Relationship between lymphatic and cardiovascular system

- Lymph fluid
- Lymph movement
- Lymph node
- Thymus
- Spleen
- Peyer’s patches
- Immune response to pathogens
- Antigen / antibody
- Specific and non-specific body defenses
- Inflammation
- B and T cells
- Vaccinations
**Respiratory System** (Ch 13)

Label Organs
Functional Unit: Alveoli
Gas Exchange ($O_2$ and $CO_2$)
Respiratory membrane
How does breathing happen?
Air Pressure vs. Muscular Contractions / Recoiling
Respiration (4 events)
  - Pulmonary ventilation
  - External respiration
  - Respiratory gas transport
  - Internal respiration

Inspiration
Expiration
**Digestive System (Ch 14)**

Label Organs (Alimentary canal and accessory organs)

Alimentary Canal Cross-section: 4 tissue layers [mucosa, submucosa, muscular, serosa]

Alimentary Canal organ functions

- [mouth, teeth, esophagus, stomach, small intestines, large intestines, rectum, anus]

Accessory organ functions

- [salivary glands, pancreas, liver, gall bladder]

Chemical vs. Mechanical Digestion

Enzymes (amylase, pepsinogen, pepsin, lipase)

Peristalsis

Sources of Nutrition (carbohydrates, protein, lipids)

Chemical digestion of carbohydrates, protein, lipids – location(s) and enzymes

Absorption process of nutrients (glucose, amino acids, fatty acids) (blood vessels or lacteals)

Functional Unit on Intestines: Villi

Metabolism of carbohydrates, protein, lipids
Urinary System (Ch 15)
Label Organs
Label Kidney Cross-Section
Neuron Filtration and Re-absorption of materials into blood
Function of Kidneys
Urinary system pathway (blood filtration to urine elimination)
Filtration
Urine formation
Water Balance
Reproductive System, Pregnancy and Fetal Development (Ch 16)

Label organs
Spermatogenesis in testes
Oogenesis in ovaries
Role of corpus luteum
Hormonal control (male/female)
  FSH
  LH
  Testosterone
  Estrogen
  Progesterone
Mammary glands
Growth and development; puberty, menarche, menopause
Uterine (Menstrual) Cycle
Fertilization
Implantation
Effects of pregnancy on the mother (gastrointestinal, urinary, cardiovascular, respiratory)
Developmental stages [gamete, zygote, blastocyst, embryo, fetus]
Birth – Stages of Labor (3)