I. Pectoral Girdle (Shoulder)
   a) Attaches the bones of the upper limb to the axial skeleton
   b) Consists of the clavicle & scapula
      i) AKA: collarbone and shoulder blade
   c) Clavicle: S-shaped bone articulating with the manubrium of the sternum (sternoclavicular joint) and the acromion of the scapula (acromioclavicular joint).
      i) Has a medial sternal extremity, a lateral acromial extremity, costal tuberosity for attachment of a rib ligament, and a conoid tubercle for ligament attachment.
      ii) The medial 1/3 of the clavicle is convex toward the anterior and the lateral 1/3 is concave toward the anterior.
   d) Scapula: a large, triangular, flat bone in the superior portion of the posterior thorax.
      i) Contains the acromion, spine, superior angle, superior border, scapular notch, coracoid process, glenoid cavity, lateral border, medial border, subscapular fossa, inferior angle, supraspinous fossa, infraspinous fossa, and the body.
      ii) All of these are specifically for muscle, tendon, or ligament attachment or for the formation of a joint.
      iii) There are two joints associated with the scapula to make up the shoulder.
          (1) The glenohumeral joint: the head of the humerus articulates with the glenoid cavity to form the ball-and-socket joint of the shoulder.
          (2) The acromioclavicular joint (AC Joint): the clavicle and acromion articulate side-by-side as a stabilizing joint.
II. The Upper Limb
   a) Consists of the humerus (arm), ulna & radius (forearm), carpals (wrist), and metacarpals & phalanges (hand)
   b) The Humerus: forms the arm or brachium
      i) Proximally articulates with the glenoid cavity at the glenohumeral joint of the shoulder
      ii) Distally articulates with the radius and ulna to form the elbow
      iii) Contains the head of the humerus, surgical neck, anatomical neck, greater & lesser tubercle, intertubercular sulcus, deltoid tuberosity, body or shaft, radial fossa, coronoid fossa, medial epicondyle, lateral epicondyle, trochlea, capitulum, and olecranon fossa
   c) The Ulna: the medial bone of the forearm
      i) Articulates proximally with the trochlea of the humerus.
      ii) Contains a distal ulnar head, a proximal olecranon, coronoid process, ulnar tuberosity, radial notch of ulna, and the styloid process of ulna.
   d) The Radius: the lateral bone of the forearm
      i) Articulates proximally with the capitulum of the humerus and distally with the lunate & scaphoid of the carpals.
      ii) Contains the proximal radial head, radial neck, radial tuberosity, styloid process of radius, ulnar notch of radius, articulation for lunate (medial), and articulation for scaphoid (laterally)
      iii) The radius and ulna articulate with each other at three locations
          (1) The proximal radioulnar joint: where the radial head articulates with the radial notch of ulna in the elbow.
          (2) Mid-shaft via an interosseous membrane holding the shafts of radius and ulna together.
          (3) The distal radioulnar joint: where the head of the ulna articulates with the ulnar notch of radius.
   e) The Carpals
      i) 8 short bones (except pisiform) arranged in two rows of 4, joined together by gliding joints and articulated with the radius & ulna proximally and the metacarpals distally to make up the wrist
      ii) Proximal row of carpals listed laterally to medially:
Scaphoid, Lunate Triquetrum, Pisiform

Distal Row of carpals listed laterally to medially:
(1) trapezium, trapezoid, capitate, hamate

f) Metacarpals
i) The most proximal row of long bones in the hand.
ii) Metacarpals have a base, shaft, and head (proximal to distal)
iii) Numbered I-V, laterally to medially starting with the thumb side.
iv) Articulate proximally with the carpals at the carpometacarpal joints
v) Articulate distally with the phalanges at the metacarpophalangeal joints or MCPs

Phalanges (Singular: Phalanx)
i) The bones of the digits
ii) Phalanges have a proximal base, shaft, and distal head.
iii) First digit (the thumb or pollex) has only 2 phalanges (a proximal and distal phalanx) and the joints associated are called the MCP and the interphalangeal joint (IP joint)
iv) Digits II-V all have three phalanges (proximal, middle, and distal) and the joints associated are the MCPs, PIPs, and DIPs.

III. The Pelvic (Hip) Girdle
a) Consists of two hip bones (aka coxal bones, aka inominate bones) that each articulate posteriorly with the ipsilateral auricular surface of the sacrum (forming the sacroiliac joints) and also articulate with each other anteriorly at the pubic symphysis.
b) The pubic symphysis is fibrocartilage disc in the anterior portion of the pelvis
c) The ring formation formed by the two hip bones, the sacrum, and the pubic symphysis is called the bony pelvis
d) The hip bone is divided into three separate bones that fuse in adulthood.
e) The Ilium is the largest of the three bones of the hip bone
i) The most superior portion
f) The Ischium is the inferior-posterior portion of the hip bone
i) Contains a body, ramus of the ischium, lesser sciatic notch, ischial tuberosity, and ischial spine.
g) The Pubis is the anterior and inferior portion of the hip bone
i) Contains the superior ramus of pubis, iliopsoas line, pubic tubercle, body of pubis, Inferior ramus of pubis.
h) The hip bone contains two major markings that more than one bone of the hip contribute to.
i) Obturator Foramen: this is a foramen whose walls are formed by the ischium and the pubis for the passage of blood vessels and nerves.
ii) The Obturator foramen is closed by the obturator membrane.
iii) The acetabulum is a deep fossa made up by the ischium, pubis, and the ilium.
1) The acetabulum is the joint surface that articulates with the head of the femur to form the true ball & socket hip joint.
ij) Pelvic Brim: A line from the sacral promontory, following around one arcuate line, around the ipsilateral iliopsoas line of the pubis, the superior aspect of the pubis symphysis, the contralateral iliopsoas line, and then follow the arcuate line back to the sacral promontory.
j) False (greater) Pelvis: the portion of the bony pelvis superior to the pelvic brim.
i) Bordered posteriorly by the lumbar vertebrae, laterally by the superior portions of the hip bones, and anteriorly by the abdominal wall.
ii) This space enclosed here is part of the abdomen and contains no pelvic organs (except the full bladder and pregnant uterus)
k) True (lesser) Pelvis: The bony portion inferior to the pelvic brim.
i) Bordered posteriorly by the sacrum & coccyx, laterally by the ischia & inferior ilia, and anteriorly by the pubic ones & symphysis.
ii) The true pelvis surrounds the pelvic cavity.
iii) The superior opening is at the pelvic brim, also known as the pelvic inlet
iv) The inferior opening is known as the pelvic outlet
v) See Table 8.5 (pg. 264) to compare the differences between the male & female pelves.

IV. The Lower Limb (femur, tibia, fibula, tarsals, metatarsals, and phalanges)

a) The Femur (thigh bone)
   i) The longest, heaviest, and strongest bone in the body.
   ii) The proximal end of the femur articulates with the acetabulum at the hip joint (femoroacetabular joint).
   iii) The distal end articulates with the tibia & patella at the knee joint (tibiofemoral joint & patellofemoral joint).
   iv) The shaft of the femur angles medially as it travels toward the knee, bringing the knees closer to the midline of the body and creating the “Q angle”.
      (1) Due to the wider female pelvis, the angle created at the knee is greater than in males, putting more stress on the knee ligaments of women.
   v) The femur contains: Head, fovea capitis, neck, greater trochanter, lesser trochanter, intertrochanteric line, intertrochanteric crest, gluteal tuberosity, linea aspera, body (shaft), lateral epicondyle, medial epicondyle, lateral condyle, medial condyle, & intercondylar fossa.

b) The Patella (knee cap)
   i) The patella is the largest sesamoid bone in the body.
   ii) Small, triangular bone that articulates posteriorly with the femur at the patellofemoral joint.
   iii) the base is the broad, superior portion
   iv) the apex is the narrow, inferior portion
   v) The articular facets are found posteriorly and lined with hyaline cartilage for the joint surface
   vi) The Patella forms in the tendon of the quadriceps femoris muscle group to protect the tendon from the constant stress of repetitive knee flexion from walking.
   vii) The tendon superior to the patella is called the quadriceps tendon
   viii) The tendon inferior is called the patellar ligament (commonly, and incorrectly, known as the patellar tendon)
   ix) The patella glides superiorly & inferiorly along the groove formed by the anterior aspect of the femoral condyles.
   x) Chondromalacia Patella: a degeneration of the hyaline cartilage on the patellar articular facets, causing a bone-on-bone grinding in the patellofemoral joint.
      (1) Usually a form of arthritis
   xi) Runner’s Knee (patello-femoral stress syndrome): When the patella begins to glided laterally as well as superoinferiorly, causing increased pressure on the joints and stress on the quadriceps and patellar tendons.
      (1) Usually cause by running on uneven surfaces

c) Tibia (shin bone):
   i) The larger, medial, weight-bearing bone of the leg
   ii) Articulates proximally (knee) with the femur at the tibiofemoral joint and with the head of the fibula at the proximal tibiofibular joint.
   iii) Articulates distally (ankle) with the fibula at the distal tibiofibular joint and with the talus at the talotibial joint
   iv) The tibia contains the lateral & medial condyles, tibial tuberosity, shaft, anterior crest (border), medial malleolus, & fibular notch.

d) Fibula
   i) The long, thin, lateral, non-weight-bearing bone of the leg
   ii) Articulates proximally & distally with the tibia and also distally with the talus at the talofibular joint
   iii) Contains the head, shaft, lateral malleolus

e) The Tarsals (7 bones of the foot)
   i) Calcaneus: The largest, most posterior bone
      (1) The bone of the heel
      (2) Articulates with the talus, navicular, and cuboid bones
   ii) Talus: anterior and superior to the calcaneous
      (1) articulates with the tibia, fibula, calcaneous, & navicular
      (2) forms the ankle joint with the tibia
iii) **Navicular**: anterior to the talus on the medial side of the foot (great toe side)
iv) **Cuboid**: anterior to the calcaneous, lateral to the navicular
v) **Three cuneiforms bones**: anterior to the navicular
   (1) Numbered medially to laterally, I-III
   (2) Also named in order: medial, intermediate, and lateral.

f) **The Metatarsals and Phalanges**
g) Metatarsals are the most proximal row of long bones in the foot.
h) They have a **base, shaft, and head** (proximal to distal)
   i) numbered I-V, medially to laterally starting with the great toe side.
   ii) articulate proximally with the tarsals at the **tarsometatarsal joints**
   iii) Articulate distally with the phalanges at the **metatarsalphalangeal joints or MTPs**
   iv) **Phalanges** have a proximal **base**, a **shaft**, and distal **head**.
v) First digit (the great toe, aka **hallux**) has only 2 phalanges (a proximal and distal phalanx) and the joints associated are called the MTP and the **interphalangeal joint (IP joint)**
vi) Digits II-V all have three phalanges (proximal, middle, and distal) and the joints associated are the MTPs, PIPs, and DIPs.

vii) **Arches**: the tarsal and metatarsal bones are arranged to form arches, which function to enable the foot to:
   (1) Support the weight of the body
   (2) Provide ideal distribution of body weight over the hard and soft tissue of the foot
   (3) Provide leverage while walking.
   (4) There are two arches: Longitudinal arch traveling anterior to posterior from the toes to the heel and the transverse arch traveling medial to lateral from the navicular along the three cuneiforms and metatarsal heads.