Goals and objectives for the Radiology 709A General Elective. This is not an all-inclusive list of relevant topics to medical student education but will serve to outline what each medical student should strive to learn at a minimum. Please defer to the assigned reading list to ensure a more complete radiology introduction.

**General Imaging Concepts**
- What are important factors that determine if and how well you see different organs in imaging?
- What is the importance of a *diffuse* disease process versus a *local* disease process?

**Physics Concepts & Modality Differences**
- Categorize different tissues from most to least opaque on radiograph including: bone, soft tissue, air, metal, and fat.
- Compare and contrast the benefits and limitations of different radiologic modalities including: Plain film, CT, Ultrasound, MR, Nuclear medicine.
- List risks associated with radiation exposure.
- Describe the impact of patient age on radiation sensitivity and how that effects each study ordered.
- Distinguish between the different types of contrast used in imaging exams and the potential diagnostic benefits of each.
- Discuss the potential complications of intravenous contrast administration for CT and MR exams and identify predisposing risk factors.
- Describe different methods for reducing the risk of contrast nephropathy.
- Summarize risks and contraindications unique to MR examinations.

**Chest Imaging**
- Employ a systematic search pattern for interpreting chest Radiographs.
- Recognize normal anatomic structures of the chest on imaging exams.
- Identify the different chest radiographic views and describe when they are helpful, as well as the limitations of each.
- List different types of morphologies that can are commonly seen on a chest radiograph.
- Identify consolidation on chest radiograph and formulate a differential diagnosis for the appearance.
- Discuss chest radiographic findings that may help characterize a lung opacity as atelectasis.
- Recognize a pleural effusion at chest radiograph on supine, upright and decubitus exams.
- Describe radiographic signs of a pneumothorax.
- Differentiate between hydrostatic edema versus non-cardiogenic edema on a chest radiograph.
- Discuss the criteria for diagnosis of enlarged cardiac silhouette on PA versus AP chest radiograph.
- What are the 6 most common causes for obstructive pulmonary disease?
- Define ‘ball under the carpet’. Where is a mass located if it looks like a ‘ball under the carpet’?
- Recognize the correct and incorrect positioning of feeding tubes, venous lines and endotracheal tubes on radiographs.
- What are 2 important imaging signs of an abnormal mediastinum?
- What are the 3 most common reasons for a ‘wide mediastinum’?
- What is the most common appearance of a pulmonary embolus on a chest radiograph.
- What are the most common signs, symptoms and vital signs of a pulmonary embolus?
- What factor is the most important determinant of distribution of disease within the lungs?

**Musculoskeletal Radiology**
- Identify and name the following bones on radiograph and identify important anatomic landmarks: Humerus, radius, ulna, carpal bones, metacarpals and phalanges, femur, fibula, tibia, tarsal bones, calcaneus, metatarsals, vertebrae, ribs, pelvis, clavicles and scapulae.
- Differentiate between the metaphysis, diaphysis, and epiphysis of a long bone on radiograph.
- Use proper terminology when describing a fracture.
- Explain the significance of intra-articular extension or physeal involvement of a fracture.
- Recognize a non-displaced fracture on radiographs.
- Explain the importance of multiple radiograph views in fracture diagnosis.
- Identify an elbow joint effusion on radiographs.
- Differentiate between anterior and posterior dislocations of the shoulder on radiographs.
OHSU RAD 709A Goals and Objectives

- What are the 4 major mechanisms of injury to the pelvis?
- Discriminate between the general types of soft tissue & osseous injuries best evaluated by CT or MR.
- Construct the appropriate imaging approach for common diagnostic scenarios including: chronic joint pain or suspected arthritis, chronic back pain, acute back pain, trauma, neck trauma, occult hip fracture, suspected osteomyelitis, screening for metastatic disease.

Neuroradiology

- Identify normal anatomic structures of the head and neck, brain, and spine on imaging exams and compare the degree of anatomic detail between CT and MR.
- When is MRI a more appropriate modality for spine imaging?
- What is the difference between vasogenic edema and cytotoxic edema? What are common causes for both?
- Recognize imaging signs of increased intracranial pressure and herniation.
- Discriminate between a subdural and epidural hematoma at CT.
- Describe imaging signs of a subarachnoid hemorrhage.
- Construct the appropriate imaging approach for common diagnostic scenarios including: suspected stroke, suspected subarachnoid hemorrhage, head trauma, spine trauma, facial trauma, metastatic disease to the CNS, seizures, dementia, brain tumor follow up, sinus disease.

Abdominal Imaging

- What are the 6 Important Things you should search for when interpreting an abdominal radiograph?
- Recognize abdominal organs on cross sectional imaging studies.
- Recognize the correct and incorrect positioning of feeding tubes.
- Recognize free intra-abdominal air on plain film and describe how patient positioning may affect sensitivity for its detection.
- What is ‘Rigler’s Sign’ on an abdominal radiograph?
- Differentiate between dilated small bowel and large bowel on plain film.
- Describe how gas may be used as a contrast with an abdominal radiograph.
- Consider how imaging can be used, and abused, for common diagnostic scenarios including: renal colic, suspected appendicitis, hematuria, right upper quadrant pain, pancreatitis, suspected small bowel obstruction, suspected diverticulitis, pelvic pain in a woman.

Ultrasound

- Summarize the benefits and limitations of ultrasound as an imaging modality.
- What body habitus is best suited for abdominal ultrasound? How does this differ with CT of the abdomen?
- Explain why ultrasound is a good modality for assessing vascular structures.
- Describe the role of ultrasound in the workup of the following symptoms: Right upper quadrant pain, renal colic, suspected appendicitis, evaluation of a breast mass, first trimester vaginal bleeding, post-menopausal vaginal bleeding, female pelvic pain, testicular torsion.

Emergency Radiology

- Discuss the role of abdominal ultrasound in the assessment of an acute trauma patient.
- What does acute blood look like on the FAST Exam?
- Review criteria for performing CT in trauma patient.
- When does one order a C-spine radiograph versus a CT scan for cervical spine trauma?
- What are the risks of scanning a low pretest probability patient versus the risks of not scanning?