I: System Operations and Instrumentation - 14%
II: Data Acquisition and Post Processing – 12%
III: Image Quality and Quality Assurance – 13%
IV: Patient Management – 6%
V: Medications and Contrast Agents – 14%
VI: CT Procedures: Anatomy, Elements, Indications, & Pathology – 25%
VII: Radiation Safety – 16%

I. Domain I: System Operations and Instrumentation (14%)
   A. Identify Characteristics of the operator’s console/acquisition station
   B. Recognize the essential design and function of CT equipment
      1. Host computer/reconstruction station
      2. CT Radiographic tube
      3. Gantry/table features
      4. Detectors
      5. Data acquisition system
      6. Array processor
   C. Classify filtration applications
   D. Illustrate the effects and usage of collimation
   E. Distinguish safe operation of power injectors with consideration to their limitations
   F. Utilize image archiving principles within the communication system
   G. Apply equipment quality assurance measures prior to usage

II. Domain II: Data Acquisition and Post Processing (12%)
   A. Explain the process of digital CT image production
   B. Differentiate among scanning methods
      1. Conventional serial CT scan
      2. Step and shoot scanning
3. Shielding (shielding equations)
C. Identify the characteristics of localizer scans
D. Recognize principles of image reconstruction
E. Apply principles of post-processing techniques
F. Differentiate among slice plans
G. Recognize how to set and confirm landmarks

III. Domain III: Image Quality and Quality Assurance (13%)
A. Recognize influences on parameter selection
B. Distinguish factors that impact image quality and apply problem solving techniques
   1. Image noise
   2. Reconstruction interval
   3. Reconstruction algorithm/kernel
   4. Matrix
   5. Magnification
   6. Windowing
   7. Artifacts
   8. Slice thickness
   9. Partial volume effect
   10. Field of view
   11. Patient related
C. Apply knowledge of linear attenuation coefficient usage
D. Differentiate between CT number and Hounsfield units
E. Define interscan spacing and its application
F. Apply quality assurance process to evaluating images

IV. Domain IV: Patient Management (6%)
A. Provide patient education and preparation
B. Perform patient screening and assessment
   1. Contraindications (e.g., renal insufficiency)
   2. Medication and results of laboratory testing
C. Perform an ongoing assessment and respond to changes in the patient’s condition
D. Utilize patient positioning and immobilization devices
E. Identify principles of patient documentation, record keeping, and confidentiality
F. Verify physician orders

V. Domain V: Medications and Contrast Agents (14%)
A. Identify intravenous contrast agents and their properties/usage
   1. Contraindications
   2. Adverse reactions and events
   3. Viscosity/osmolality
4. IV size
5. Volume
6. Flow duration
7. Flow rate

B. Identify other contrast agents and their properties/usage/routs
   1. Gastrointestinal contrast agents
   2. Intrathecal contrast
   3. Rectal contrast
   4. Vaginal contrast
   5. Intraarticular contrast

C. Identify bolus parameters, timing, and tracking

D. Recognize common medications for managing contrast reactions

VI. Domain VI: CT Procedures: Anatomy, Elements, Indications, and Pathology (25%)

A. Demonstrate fundamental parameters of head CT
   1. Routine brain
   2. Trauma
   3. Internal auditory canals
   4. Pituitary
   5. Orbits
   6. Sinuses
   7. Maxillofacial
   8. Temporomandibular joint
   9. Angiography-Circle of Willis

B. Demonstrate fundamental parameters of neck CT
   1. Routine soft tissue neck
   2. Trauma
   3. Larynx
   4. Parathyroid
   5. Angiography-Carotids

C. Demonstrate fundamental parameters of spine CT
   1. Cervical spine
   2. Thoracic spine
   3. Lumbosacral spine
   4. Trauma
   5. Post-Myelography spine

D. Demonstrate fundamental parameters of musculoskeletal CT
   1. Shoulder
   2. Elbow
   3. Wrist
   4. Hand
5. Hips
6. Knee
7. Ankle
8. Foot
9. Long bones
10. Arthrogram

E. Demonstrate fundamental parameters of chest CT
   1. Routine chest
   2. Lung
      a. High resolution
      b. Low dose screening
      c. Respiratory gating
   3. Angiography-Thoracic aorta
   4. Angiography-Pulmonary vessels/PE exam

F. Demonstrate fundamental parameters of abdomen CT
   1. Routine abdomen
   2. Tri-phase liver
   3. Pancreas
   4. Kidneys
   5. Renal calculi
   6. Adrenals
   7. Ureteral calculi/urogram
   8. Angiography – abdomen
   9. Trauma

G. Demonstrate fundamental parameters of pelvis CT
   1. Bladder
   2. Trauma
   3. Angiography – run-offs

H. Demonstrate fundamental parameters of cardiac CT
   1. Angiography – cardiac
   2. Calcium scoring
   3. Cardiac gating

I. Recognize characteristics of special procedures
   1. Biopsy
   2. Drainage

J. Recognize characteristics of PET/CT
   1. Anatomy
   2. Physiology
   3. Organ systems
   4. Attenuation correction

K. Recognize characteristics of SPECT/CT
   1. Anatomy
   2. Physiology
3. Organ systems
4. Attenuation correction
L. Recognize procedural differences for patient populations (e.g., pediatric, body habitus)

VII. **Domain VII: Radiation Safety (16%)**
   A. Recognize biological effects of ionizing radiation
   B. Recognize elements of dose reporting and measurements/units
   C. Apply dose optimization techniques
      1. Hardware factors
      2. Scan parameters
      3. Reformat
      4. Repeat scans
      5. Radiation penumbra
   D. Recognize dosing modifications for patient populations (e.g., pediatric, body habitus, pregnancy)
   E. Recognize elements, types, and applications of shielding (e.g., PPE, ALARA)