# NMED-1781: SECTIONAL ANATOMY FOR ADVANCED MOLECULAR IMAGING

## Cuyahoga Community College

### Viewing: NMED-1781 : Sectional Anatomy for Advanced Molecular Imaging

**Board of Trustees:**
January 2024

**Academic Term:**
Fall 2024

**Subject Code**
NMED - Nuclear Medicine Technology

**Course Number:**
1781

**Title:**
Sectional Anatomy for Advanced Molecular Imaging

**Catalog Description:**
Study of human anatomy and its appearance in multiple planes. Includes all commonly imaged body systems and areas as well as discernment of abnormal pathology and how to make the associated imaging changes required to adequately demonstrate the patients anatomy and pathology. Covers imaging planes and anatomy imaged by nuclear medicine, computed tomography, and magnetic resonance imaging.

**Credit Hour(s):**
3

**Lecture Hour(s):**
3

### Requisites

**Prerequisite and Corequisite**
NMED-1302 Nuclear Medicine Procedures I; and concurrent enrollment in NMED-1771 Immunology and Pathophysiology for Sectional Imaging; and departmental approval: admission to program.

### Outcomes

**Course Outcome(s):**
Identify normal anatomy and abnormal conditions in multiple planes and make the associated imaging changes required to adequately demonstrate the patient's anatomy and pathology.

**Objective(s):**
1. Identify anatomical structures as seen in multiple orthogonal planes on nuclear medicine, computed tomography, and magnetic resonance images.
2. Competently describe gross anatomic relationships in the body.
3. Competently describe anterior-posterior, proximal-distal and lateral-medial relationships of anatomy.

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**Course Outcome(s):**
Identify the appearance of common pathologies found in various imaging protocols of nuclear medicine, computed tomography, and magnetic resonance imaging inclusive of all commonly-imaged body systems.

**Objective(s):**
1. Distinguish normal anatomy from abnormal anatomy across various planes and sections.
2. Identify changes in anatomical sizes and shapes of structures that can indicate pathology.

**Methods of Evaluation:**

1. Participation
2. Worksheets
3. Quizzes
4. Exams
5. Case studies

**Course Content Outline:**

1. The anatomy of the head including muscular, venous, skeletal, nervous structures.
    a. Bones of the skull and cranium
    b. The brain
        i. Regions of the brain
        ii. The ventricular system
        iii. Meninges
        iv. Arterial blood supply
        v. Venous drainage
        vi. Cranial nerves
        vii. The orbital cavity
        viii. Auditory canal
        ix. Endocrine system - pituitary gland
            1. Sphenoid bone
            2. Infundibulum
            3. Hypophysis (pituitary gland)
2. The anatomy of the spine including muscular, venous, skeletal, nervous structures
    a. Vertebral column
    b. Typical vertebrae components
    c. Sacrum
    d. Coccyx
    e. Intervertebral discs
    f. Spinal cord
    g. Spinal plexus
3. The anatomy of the neck, including soft tissue, muscular, and vasculature
    a. Tissue organization
    b. Viscera of the neck
        i. Pharynx
        ii. Retropharyngeal space
        iii. Larynx (distinguishing between true and false cords)
        iv. Esophagus
        v. Trachea
        vi. Thyroid glands
        vii. Salivary glands
    c. Vascular supply (major branches)
    d. Musculature of the neck
4. The anatomy of the thorax including muscular, venous, skeletal, nervous structures
    a. Skeletal anatomy of the thorax
    b. Thoracic cavity
    c. Heart
        i. Superficial features of the heart
        ii. Chambers and valves
        iii. Vascular supply and drainage
        iv. The great vessels of the heart
        v. Associated thoracic structures
        vi. Breast
        vii. Lymphatic system
5. The anatomy of the abdomen including major organs, muscular, venous, nervous structures

a. Abdominal regions
b. Diaphragm
c. Abdominal musculature
d. Abdominal peritoneum
e. Peritoneal cul-de-sacs
f. Abdominal vasculature
g. Venous drainage of the abdomen
h. Hepatic portal system
i. Abdominal viscera
j. Liver
k. Gallbladder
l. Esophagus
m. Stomach
    i. Vasculature
    ii. Divisions
n. Small intestine
o. Large intestine
p. Spleen
q. Pancreas
r. Kidneys
s. Suprarenal gland

6. The anatomy of the pelvis including major organs, muscular, vasculatures, skeletal, nervous structures and innervation
    a. Bony pelvis
    b. Pelvic musculature
    c. Vasculature
    d. Innervation
    e. Pelvic viscera
    f. Gastrointestinal organs
    g. Urinary organs and system
    h. Viscera of the female pelvis
        i. Peritoneal folds
        ii. Ligaments
        iii. Ovaries
        iv. Uterus
        v. Uterine tubes
        vi. Cervix
        vii. Vagina
        viii. Maternal and fetal
    i. Viscera of the male pelvis
        i. Scrotum
        ii. Ductus deferens
        iii. Spermatic cord
        iv. Cremaster muscle
        v. Seminal vesicles
        vi. Prostate
        vii. Bulbourethral glands
        viii. Penis
    j. External genitalia and related perineum
        i. Female external genitalia
        ii. Male external genitalia
7. Upper extremity anatomy, including muscular, vasculature, skeletal, nervous structures and innervation
    a. Shoulder joint
    b. Upper arm (brachium)
    c. Elbow joint
    d. Cubital fossa
    e. Forearm
    f. Wrist
    g. Hand

8. Lower extremity anatomy, including muscular, vasculature, skeletal, nervous structures and innervation
    a. Hip joint
    b. The thigh
    c. The knee
    d. The leg
    e. The ankle
    f. The foot

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## Resources

Damjanov, Ivan. (2021) *Pathology for the Health Professions*, Elsevier Saunders.

Bolus, N. & Glasgow, K.W. (eds). (2018) *Review of Nuclear Medicne Technolgy*, Reston, VA: Society of Nuclear Medicine and Molecular Imaging.

Ziessman, H.A., J.P. O'Malley, & J.H. Thrall. (2014) *Nuclear Medicine: The Requisites*, Elsevier.

Lee, K.H. (2015) *Basic Science of Nuclear Medicine: Bare Bone Essentials*, Reston, VA: Society of Nuclear Medicine and Molecular Imaging.

Mettler, F & M. Guiberteau. (2019) *Essentials of Nuclear Medicine*, Philadelphia, Pa.: W.B. Saunders. .

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