NMED-1770: IMMUNOLOGY AND PATHOPHYSIOLOGY FOR SECTIONAL IMAGING

Cuyahoga Community College

Viewing: NMED-1770: Immunology and Pathophysiology for Sectional Imaging

Board of Trustees:
2014-06-19

Academic Term:
2014-08-27

Subject Code
NMED - Nuclear Medicine Technology

Course Number:
1770

Title:
Immunology and Pathophysiology for Sectional Imaging

Catalog Description:
Introduction to pathophysiology and immunology. Emphasis is on common pathologies found in nuclear medicine, computed tomography, and magnetic resonance imaging and the appearance of these pathologies across multiple planes in various imaging protocols. Includes all commonly-imaged body systems with recognition of abnormal conditions across multiple planes and ability to make the associated imaging changes required to adequately demonstrate the patients pathology.

Credit Hour(s):
2

Lecture Hour(s):
2

Requisites
Prerequisite and Corequisite
Concurrent enrollment in NMED-1780 Sectional Anatomy for Advanced Molecular Imaging.

I. ACADEMIC CREDIT

Academic Credit According to the Ohio Department of Higher Education, one (1) semester hour of college credit will be awarded for each lecture hour. Students will be expected to work on out-of-class assignments on a regular basis which, over the length of the course, would normally average two hours of out-of-class study for each hour of formal class activity. For laboratory hours, one (1) credit shall be awarded for a minimum of three laboratory hours in a standard week for which little or no out-of-class study is required since three hours will be in the lab (i.e. Laboratory 03 hours). Whereas, one (1) credit shall be awarded for a minimum of two laboratory hours in a standard week, if supplemented by out-of-class assignments which would normally average one hour of out-of-class study preparing for or following up the laboratory experience (i.e. Laboratory 02 hours). Credit is also awarded for other hours such as directed practice, practicum, cooperative work experience, and field experience. The number of hours required to receive credit is listed under Other Hours on the syllabus. The number of credit hours for lecture, lab and other hours are listed at the beginning of the syllabus. Make sure you can prioritize your time accordingly. Proper planning, prioritization and dedication will enhance your success in this course.

The standard expectation for an online course is that you will spend 3 hours per week for each credit hour.

II. ACCESSIBILITY STATEMENT

If you need any special course adaptations or accommodations because of a documented disability, please notify your instructor within a reasonable length of time, preferably the first week of the term with formal notice of that need (i.e. an official letter from the Student Accessibility Services (SAS) office). Accommodations will not be made retroactively.

For specific information pertaining to ADA accommodation, please contact your campus SAS office or visit online at http://www.tri-c.edu/accessprograms/. Blackboard accessibility information is available at http://access.blackboard.com.
Eastern (216) 987-2052 - Voice
III. ATTENDANCE TRACKING

Regular class attendance is expected. Tri-C is required by law to verify the enrollment of students who participate in federal Title IV student aid programs and/or who receive educational benefits through other funding sources. Eligibility for federal student financial aid is based in part on enrollment status.

Students who do not attend classes for the entire term are required to withdraw from the course(s). Additionally, students who withdraw from a course or stop attending class without officially withdrawing may be required to return all or a portion of their financial aid based on the date of last attendance. Students who do not attend the full session are responsible for withdrawing from the course(s).

Tri-C is responsible for identifying students who have not attended a course before financial aid funds can be applied to students’ accounts.

Therefore, attendance is recorded in the following ways:

- For in-person and blended-learning courses, students are required to attend the course by the 15th day of the semester (or equivalent for terms shorter than five weeks) to be considered attending. Students who have not met all attendance requirements for in-person and blended courses, as described herein, within the first two weeks or equivalent, will be considered not attending.
- For online courses, students are required to login at least two times per week and submit one assignment per week for the first two weeks of the semester, or equivalent to the 15th day of the term. Students who have not met all attendance requirements for online courses, as described herein, within the first two weeks or equivalent, will be considered not attending.

At the conclusion of the first two weeks of a semester or equivalent, instructors report any registered students who have “Never Attended” a course. Those students will be administratively withdrawn from that course. However, after the time period in the previous paragraphs, if a student stops attending a class or wants or needs to withdraw, for any reason, it is the student’s responsibility to take action to withdraw from the course. Students must complete and submit the appropriate Tri-C form by the established withdrawal deadline.

Tri-C is required to ensure that students receive financial aid only for courses that they attend and complete. Students reported for not attending at least one of their registered courses will have all financial aid funds held until confirmation of attendance in registered courses has been verified. Students who fail to complete at least one course may be required to repay all or a portion of their federal financial aid funds and may be ineligible to receive future federal financial aid awards. Students who withdraw from classes prior to completing more than 60 percent of their enrolled class time may be subject to the required federal refund policy.

If illness or emergency should necessitate a brief absence from class, students should confer with instructors upon their return. Students having problems with coursework due to a prolonged absence should confer with the instructor or a counselor.

IV. LEARNING OUTCOMES ASSESSMENT

Occasionally, in addition to submitting assignments to their instructors for evaluation and a grade, students will also be asked to submit completed assignments, called ‘artifacts,’ for assessment of course and program outcomes and the College’s Essential Learning Outcomes (ELOs). The artifacts will be submitted in Blackboard or a similar technology. The level of mastery of the outcome demonstrated by the artifact DOES NOT affect the student’s grade or academic record in any way. However, some instructors require that students submit their artifact before receiving their final grade. Some artifacts will be randomly selected for assessment, which will help determine improvements and support needed to further student success. If you have any questions, please feel free to speak with your instructor or contact the Learning Outcomes Assessment office.

V. CONCEALED CARRY STATEMENT

College policy prohibits the possession of weapons on college property by students, faculty and staff, unless specifically approved in advance as a job-related requirement (i.e., Tri-C campus police officers) or, in accordance with Ohio law, secured in a parked vehicle in a designated parking area only by an individual in possession of a valid conceal carry permit.

As a Tri-C student, your behavior on campus must comply with the student code of conduct which is available on page 29 within the Tri-C student handbook, available athttp://www.tri-c.edu/student-resources/documents/studenthandbook.pdfYou must also comply with the College’s Zero Tolerance for Violence on College Property available athttp://www.tri-c.edu/policies-and-procedures/documents/3354-1-20-10-zero-tolerance-for-violence-policy.pdf

Outcomes

Course Outcome(s):
A. Explain the basic concepts of human immunity and pathophysiology.

Objective(s):
1. 2. Identify the nature and courses of the pathologies relevant to diagnostic imaging.
2. 7. Explain cell and antibody mediated immunity.
3. 8. Explain the basic components and mechanisms for human immunity.
Course Outcome(s):
B. Differentiate between normal and abnormal anatomy appearance across varying planes for nuclear medicine, computed tomography, and magnetic resonance imaging images.

Objective(s):
1. 1. Describe the effect of contrast agents on visualizing pathology.
2. 4. Identify changes in anatomical sizes and shapes of structures that can indicate pathology.
3. 5. Identify abnormalities created by contrast imaging agents or poor imaging techniques.
4. 6. Display understanding of the signal characteristics displayed by abnormal tissues during various pulse sequences and imaging modes in illustrating pathological processes.

Course Outcome(s):
C. Identify 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. 3. Describe basic pathological processes demonstrated by varying diagnostic imaging modalities.

Methods of Evaluation:
1. participation
2. quizzes
3. worksheets
4. exams
5. case studies

Course Content Outline:
1. Immunity and disease pathology
   a. History and overview
   b. T cell receptors
   c. B cell receptors
   d. Effector Responses: Cell and Antibody Mediated Immunity
      i. Monoclonal antibodies
   e. Hypersensitivity and Chronic Inflammation
   f. Infectious Diseases
   g. Immunodeficiency Disorders
   h. Cancer
2. Head Pathology
   a. Brain
      i. Vascular disorders
      ii. Congenital and hereditary disorders
      iii. White matter disorders
      iv. Trauma
      v. Other (i.e., aging, metabolic, idiopathic, iatrogenic, phakomatoses, etc.)
   b. Neoplastic disorders
   c. Infections and inflammatory disorders
   d. Eye and orbital contents
   e. Sinuses, pharynx (nasal and oral), and larynx
      i. Temporal bone and TMJ
      ii. Tumor and tumor-like disorders
      iii. Bell palsy
      iv. Vascular middle ear anomalies
   f. Fractures
   g. Dislocated TMJ
3. Neck Pathology
a. Masses
   i. Nasopharyngeal space
   ii. Parapharyngeal space
   iii. Parotid space
   iv. Retropharyngeal space
   v. Oropharyngeal space
   vi. Masticator space
   vii. Buccinator space
   viii. Carotid space
   ix. Laryngeal
   x. Angiofibroma
   xi. Hemangioma
   xii. Hygroma
   xiii. Thyroid
   xiv. Glomus jugulare
b. Metastases
c. Cysts
d. Sialolithiasis
e. Brachial Plexus
   i. Masses
   ii. Malignancy
   iii. Response to therapy
   iv. Trauma

4. The Spine Pathology
   a. Spine and spinal cord
   b. Tumor and tumor-like disorders
   c. Inflammatory disorders
d. Vascular disorders
e. Trauma
   f. Degenerative spine
g. Other (e.g., congenital anomalies, demyelinating disorders, etc.)

5. Thorax
   a. Mediastinum
      i. Thyroid masses
      ii. Thymoma
      iii. Duplication cysts
      iv. Lymph node enlargement
      v. Lymphoma
      vi. Teratoma
      vii. Neurogenic
      viii. Pancoast tumors
      ix. Aneurysms
      x. Esophageal tumors
   b. Chest wall
      i. Malignant processes
      ii. Inflammatory lesions
   c. Respiratory system
d. Cardiac and aorta
   i. Aneurysm
   ii. Dissection
   iii. Coarctation
   iv. Thrombus
   v. Infarction
   vi. Hypertrophic cardiomyopathy
   vii. Pericardial disease
   viii. Intracardiac masses
   ix. Valvular heart disease
   x. Congenital heart conditions
e. Breast
   i. Dysplasia
   ii. Cysts
   iii. Benign tumors
   iv. Inflammatory conditions
   v. Carcinomas
   vi. Postsurgery or radiation
   vii. Implant rupture
6. Abdomen Pathology
   a. Liver
      i. Hemangioma
      ii. Cysts
      iii. Abscesses
      iv. Hepatocellular carcinoma
      v. Hepatic metastases
      vi. Venous thrombosis
      vii. Homochromatosis
      viii. Transplant
      ix. Gallbladder and ductal anomalies
   b. Pancreas
      i. Pseudocyst
      ii. Cystic fibrosis
      iii. Pancreatitis
      iv. Transplants
      v. Adenocarcinoma
      vi. Islet cell tumors
      vii. Lymphoma
      viii. Metastases
      ix. Ductal anomalies
   c. Kidneys
      i. Polycystic kidney disease
      ii. Renal cell carcinoma
      iii. Transitional cell carcinoma
      iv. Metastatic disease
      v. Wilm’s tumor
      vi. Nephroblastoma
      vii. Infarction
      viii. Infection
      ix. Transplant
   d. Adrenals
      i. Adenoma
      ii. Metastasis
      iii. Pheochromocytoma
      iv. Neuroblastoma
      v. Hemorrhage
   e. Spleen and lymphatics
      i. Infections
      ii. Benign focal lesions
      iii. Hodgkin and non-Hodgkin lymphoma
   f. Gastrointestinal (GI) tract
      i. Colon polyps
      ii. Tumors
      iii. Congenital anomalies
   g. Vascular disorders
      i. Renal artery stenosis
7. Pelvis Pathology
a. Female reproductive organs (uterus, ovaries, vagina and associated structures)
   i. Neoplastic disorders
   ii. Inflammatory disorders
   iii. Endometriosis
   iv. Ovarian cysts
   v. Other
   vi. Congenital anomalies and hereditary disorders
   vii. Traumatic disorders
b. Male reproductive organs (prostate, seminal vesicles and associated structures)
   i. Neoplastic disorders
   ii. Inflammatory disorders
   iii. Other
c. Bladder
   i. Neoplastic disorders
   ii. Inflammatory disorders
   iii. Other

8. Musculoskeletal Pathology
   a. Skeletal system
      i. Traumatic injury
      ii. Bone fracture union
      iii. Bone neoplasms and tumor-like lesions
      iv. Inflammatory disorders
      v. Other
      vi. Soft tissues
         1. Neoplastic disorders
         2. Inflammatory disorders
   vii. Joints
         1. Fibrocartilage disorders
         2. Ligament and tendon tears
         3. Rotator cuff tear
         4. Inflammatory disorders
         5. Meniscal disorders
            a. Meniscal tears
            b. Meniscal cysts
            c. Discoid lateral meniscus
   viii. Other
        1. Trauma
        2. Congenital anomalies and hereditary disorders
        3. Bone marrow abnormalities

9. General Vascular Disorders/Pathology
   a. Atherosclerosis
   b. Postradiation injury
   c. Dissections
   d. Aneurysms
   e. Graft patency
   f. Venous mapping
   g. Vena caval tumor invasion

Resources


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