

CASPER COLLEGE COURSE SYLLABUS
RDTK 1920 H1
Computed Tomography Procedures I

Semester/Year: **FALL 2015**

Lecture Hours: 3 Lab Hours: 0 Credit Hours: 3

Class Time: 9/12,10-10,11-21 Days: Listed Saturdays 1p-4p Room:HS208

Instructor's Name: Rick Johnson

Instructor's Contact Information:	Office Phone: 268-2718 Home Phone: 258-7046	Email: rjohnson@caspercollege.edu
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Office Hours:

Course Description: This course covers the anatomy and common pathology associated with computed tomography. The anatomical structures will be demonstrated in the axial, sagittal and coronal imaging planes. Scanning protocols, contrast administration, and contraindications for computed tomography of the head, neck, chest, musculoskeletal, abdomen, and pelvis will be presented. Content provides detailed coverage of procedures for CT imaging. Procedures include, but are not limited to, indications for the procedure, patient education, preparation, orientation and positioning, patient history and assessment, contrast media usage, scout image, selectable scan parameters, filming and archiving of the images. CT procedures will be taught for differentiation of specific structures, patient symptomology and pathology. CT images studied will be reviewed for quality, anatomy and pathology. CT procedures vary from facility to facility and normally are dependent on the preferences of the radiologists. Patient Care, contrast media, venipuncture, CT injection procedures, radiation safety and protection will be emphasized for each of the scanning procedures.

Statement of Prerequisites: Admission to program, HLTK 2200 Cross sectional Anatomy

Goal: Students will gain a working knowledge of anatomy, pathology, scanning protocols, and contrast administration for computed tomography exams of the head, chest, abdomen, and pelvis. An emphasis on the importance of patient care, education and communication will be discussed. Students will utilize this basis for exams in the clinical setting while maintaining ALARA principles in radiation protection.

Outcomes:

Exam Protocol in relation to head/neck, chest, abdomen, musculoskeletal and pelvis scanning.

1. List the CT scanner and scan room preparation steps necessary for CT procedures.
2. Name the indicated CT procedure for specific anatomical structures, patient symptoms or pathology.
3. Educate the patient on the general aspects of CT and the specifics of the CT procedure.
4. Name the patient preparation required for each procedure.

5. Determine if contrast media is indicated for a specific procedure and if indicated, name the type and specify the dosage and route of administration.
6. Determine from patient medical laboratory results, patient history and charted information if the use of contrast media is contraindicated and explain why.
7. Describe the conditions that require a patient to grant informed consent in writing for a CT procedure.
8. List the range, azimuth, anatomical landmarks, patient orientation and position and technical factors used to produce scout and scan images for a given procedure.
9. Provide correct information concerning the scan field of view (SFOV), display field of view (DFOV), mode, algorithm, gantry angle, technical factors, range, table incrementation and slice thickness (z-axis) selection for each procedure.
10. List accurate window width (WW) and window level (WL) selections for each procedure protocol.
11. Explain why different window width and levels are selected.
12. List the required imaging planes for each procedure.
13. Determine the correct matrix size selection for each procedure studied.
14. List the information that should be noted on each scout and scan image.
15. Name the routine filming format for each procedure studied.
16. Perform any non-routine procedure tasks associated with CT procedures.
17. Adapt routine scanning parameters for CT procedures of the head and neck to spiral mode and explain the differences.
18. Differentiate between scanning parameters for conventional vs. spiral procedures.
19. Explain current trends in CT image archiving.
20. List postprocedure patient instructions for each procedure.
21. Describe proper procedures for patient screening.

Anatomy in relation to head/neck, chest, abdomen, musculoskeletal and pelvis CT Imaging

1. Name the anatomical structures located within the head.
2. Describe the relationship of each head anatomical structure to surrounding structures.
3. Describe the function of each anatomical structure in the head.
4. Locate each anatomical structure on CT images in the transverse axial, coronal, sagittal and orthogonal (oblique) cross-sectional imaging planes.
5. Name the anatomical structures located within the thorax.
6. Describe the relationship of each thoracic structure to surrounding structures.
7. Describe the function of each anatomical structure located within the thorax.
8. Locate each anatomical structure of the thorax on CT images in the transverse axial, coronal, sagittal and oblique imaging planes.
9. List and describe the function of each anatomical structure located within the abdomen and pelvis.
10. Describe the relationship of each anatomical structure in the abdomen and pelvis to surrounding structures.
11. Locate each anatomical structure of the abdomen and pelvis on CT images in the axial, coronal, sagittal and oblique planes.

Pathology

1. Define common terms used in the study of pathology.
2. Name the common pathological conditions affecting any of the body systems studied in this course.

3. For each common pathological condition identified in the course:
 - Describe the disorder.
 - List the etiology.
 - Name the associated symptoms.
 - Name the common means of diagnosis.
 - List characteristic CT manifestations of the pathology.
4. Identify each of the pathological conditions studied on CT images.
5. Identify pathology resulting from trauma on CT images.
6. Identify pathology common only in pediatric patients.

Methodology: lecture, discussion, hands on activities, and case study reviews.

Evaluation Criteria:

Quizzes: 50 Points Each: Course Total 200 pts.

Chapter Questions: 5 Points Each: Course Total 110 Points

Exams: 100 points Each: Course Total 200 Points

Pathology Presentations: 200 Points

Course Total: 710 Points

Grade Scale: Grade percentage scale:

A = 92-100
B = 83- 91
C = 75- 82
F = 0- 74

Required Text, Readings, and Materials:

1. Computed Tomography For Technologists, Lois Romans, Lippincott 2011
2. CT and MRI Pathology; A Pocket Atlas, Michael Grey

Class Policies: Last Date to Change to Audit Status or to Withdraw with a W Grade:

Student Rights and Responsibilities: Please refer to the Casper College Student Conduct and Judicial Code for information concerning your rights and responsibilities as a Casper College Student.

Chain of Command: If you have any problems with this class, you should first contact the instructor to attempt to solve the problem. If you are not satisfied with the solution offered by the instructor, you should then take the matter through the appropriate chain of command starting with the Department Head/Program Director, the Dean, and lastly the Interim Vice President for Academic Affairs.

Academic Dishonesty - Cheating & Plagiarism: Casper College demands intellectual honesty. Proven plagiarism or any form of dishonesty associated with the academic process can result in the offender failing the course in which the offense was committed or expulsion from school. See the Casper College Student Code of Conduct.

ADA Accommodations Policy: It is the policy of Casper College to provide appropriate accommodations to any student with a documented disability. If you have a need for accommodation in this course, please make an appointment to see me at your earliest convenience.

Course Content:

Content will include: Anatomy, Pathology, Landmarks, Contrast Media, Positioning, Parameters, Protocol, and Protocol Modifications.

Date	Content	Required Reading	Assignment
8/25-9/1 Due 9/1	Review Patient Care/Contrast Media/Radiation Protection ****Be prepared to take quiz covering Chapter 10 in Seeram Text.	1.Computed Tomography For Technologists, Review Ch. 10-14 2. Computed Tomography Author Seeram Read Ch. 10	1.Material will be presented and reviewed from areas covered in the introduction class as presented in the chapters listed to the left. 2.Quiz covering Seeram Chapter 10, Radiation Dose in CT (50 pts)
Sept. 1 Due Sept. 9	Introduction to CT Procedures Module: Basic CT Procedures	Watch module included on Moodle link: Overview: Suggested that the student take detailed notes to be used while taking quiz covering this section.	1.Watch module covering basic procedure considerations: Module may take a few minutes to load, please be patient. 2.Take quiz covering material (50 pts.)
Sept. 9-17 Due Sept. 17 <u>Class meets on Campus Sept 12th</u>	Head and Neck: Anatomy, Pathology & Neurologic Imaging: Head: Cranial Nerves, IAC, Temporal Bones, Pituitary, Orbits, Sinuses, Maxillofacial, TMJ, Posterior Fossa, Brain, Cranium, Vascular Neck: Larynx, Soft tissue, Vascular	Required: 1.Computed Tomography For Technologists, Ch. 15 & 19 2. CT and MRI Pathology; A Pocket Atlas, Pages 6-56, 103-120	1.Ch. 15: Neuroanatomy 2. Ch. 19 Neurologic Procedures: Complete chapter review questions 1-7 (35 pts)
Sept. 24-Oct. 6 Due Oct. 6	Module: Cross Sectional Anatomy of Head and Neck	Watch module included on Moodle link: Overview: Suggested that the student take detailed notes to be used while taking quiz covering this section	1.Watch module covering basic procedure considerations: Module may take a few minutes to load, please be patient. 2.Take quiz covering material (50 pts)

<p>Oct. 6-17 Due Oct. 18</p> <p><u>On Campus Class Meets Oct 10</u></p>	<p>Test</p>	<p>Exam covering Head and Neck Anatomy, Pathology, and Procedures. Covers all material covered in this course up to this point.</p>	<p>100 pts.</p>
<p>Oct. 18-27 Due Oct. 27</p>	<p>Thoracic: Anatomy, Pathology and Imaging: Mediastinum, Lung, Heart, Airway, and Vascular System</p>	<p>Required 1. Computed Tomography For Technologists, Ch. 16 & 20 Recommended 2. CT and MRI Pathology; A Pocket Atlas, Pages 123-140</p>	<p>1. Ch. 16 Thoracic Anatomy 2. Ch. 20 Thoracic Imaging Procedures: Complete chapter review questions 1-5 (25 pts)</p>
<p>Oct. 28-Nov. 10 Due Nov. 10</p>	<p>Abdominopelvic: Anatomy, Pathology, and Imaging: Abdomen: Liver, Biliary, Spleen, Pancreas, Adrenals, Kidneys, Ureters, GI Tract, Vascular Pelvis: Bladder, Colorectal, Reproductive Organs, Vascular</p>	<p>1. Computed Tomography For Technologists, Ch. 17 & 21 2. CT and MRI Pathology; A Pocket Atlas, Pages 143-210</p>	<p>1. Ch.17 Abdominopelvic Anatomy 2. Ch. 21 Abdomen and Pelvic Imaging Procedures: Complete Chapter review questions 1-7 (35 pts)</p>
<p>Nov. 10-15 Due Nov. 15</p>	<p>Module: Cross Sectional Anatomy of Chest, Abdomen, and Pelvis</p> <p>Test to be taken during class time</p>	<p>Watch module included on Moodle link: Overview: Suggested that the student take detailed notes to be used while taking quiz covering this section.</p>	<p>1. Watch module covering basic procedure considerations: Module may take a few minutes to load, please be patient. 2. Take quiz covering material (50 pts)</p>
<p><u>Due. Nov. 21 Class meets</u></p>	<p>Case Study Pathology Presentations:</p> <p>Areas Included: Head/Neck Chest Abdomen Musculoskeletal Pelvis</p>	<p>Each student will present two compete pathology case study presentations.</p> <p>Presentations must include the following:</p>	<p>Each student will present two pathologies approved by the instructor</p> <p>Presented November 15</p> <p>200 Points</p>

		<ol style="list-style-type: none"> 1. CT images demonstrating the pathology 2. Detailed description of pathology 3. Etiology 4. Epidemiology 5. Signs and symptoms 6. Lab results that may appear out of normal limits due to this pathology 7. Image Characteristics: How it appears on the CT image as demonstrated by your images 8. Treatment 9. Prognosis 	
<p>Nov. 17-30</p> <p>Due Dec. 12</p>	<p>Musculoskeletal: Anatomy, Pathology, Imaging: Upper Extremity, Lower Extremity, Spine, Pelvis, Hips, Shoulder Girdle, Sternum, Vascular, CT Arthrography, Diskography.</p>	<p>Required 1. Computed Tomography For Technologists, Ch. 18 & 22</p> <p>Recommended: 2. CT and MRI Pathology; A Pocket Atlas, Pages 213-244</p>	<p>1. Ch. 18 Musculoskeletal Anatomy.</p> <p>2. Ch. 22 Musculoskeletal Imaging Procedures: Complete chapter review questions 1-3 (15 pts)</p>
<p>Dec. 1-8</p> <p>Due Dec. 12</p>	<p>Test: Covering Thoracic, abdomen, pelvis, and musculoskeletal anatomy and imaging procedures.</p>		<p>Complete test covering CT Body Imaging 100 Points</p>
	<p>Syllabus subject to change at instructors request</p>		

Areas where students must be proficient (2011 ARRT CT Certification Handbook):

Includes: Anatomy, pathology, procedures, contrast media

- I. Head
 - a. Cranial Nerves
 - b. IAC
 - c. Temporal Bones
 - d. Pituitary
 - e. Orbits
 - f. Sinuses
 - g. Maxillofacial
 - h. TMJ
 - i. Posterior Fossa
 - j. Brain
 - k. Cranium
 - l. Vascular
- II. Neck
 - a. Larynx
 - b. Soft Tissue Neck
 - c. Vascular
- III. Chest
 - a. Mediastinum
 - b. Lung
 - c. Heart
 - d. Airway
 - e. Vascular
- IV. Abdomen
 - a. Liver
 - b. Biliary
 - c. Spleen
 - d. Pancreas
 - e. Adrenals
 - f. Kidneys/Ureters
 - g. GI Tract
 - h. Vascular
- V. Pelvis
 - a. Bladder
 - b. Colorectal
 - c. Reproductive
 - d. Vascular
- VI. Musculoskeletal
 - a. Upper Extremity
 - b. Lower Extremity
 - c. Spine
 - d. Pelvis/Hips
 - e. Shoulder Girdle
 - f. Sternum
 - g. Vascular
 - h. Post Myelography
 - i. CT Arthrography
 - j. Discograph