SPRING 2017 – COMPUTED TOMOGRAPHY CLASS

Faculty Information:	***Instructor***: TBA ***Phone***: 201 693 0630 ***E-mail:*** ajk0312@optonline.netu
Course Description:	The objective of this 28 hour class is to prepare certified radiologic technologists for the successful completion of the post primary examination in Computed Tomography (CT).
Class Meetings:	Lectures: **Saturday 9 am -11:00 am**
Required Textbooks:	E. Seeram, **Computed Tomography, Principles, Clinical Applications, and Quality Control.** (latest edition) Kelley, L**. Sectional Anatomy for Imaging Professionals**, textbook and workbook. (latest edition)
Additional Required Course Materials:	The following copyrighted materials are the sole property of the instructor. They are available on the instructor's website and are free for students enrolled in this course only. ***Computed Tomography : PPT presentations*** Konrad Consulting, Inc.

Success Criteria:	Final Exam **75%**	**75 questions**
Attendance Policy	For the students to receive credit for the seminar they must attend **100%** of the lectures. No absences in the seminar are allowed.	

Computed Tomography Class

Spring 2017 Outline

Class	Topic	Chapter	Time
1	***Introduction to CT*** 1. CT Brief Historical Trail 2. Basic principle of CT a. Data acquisition b. Data reconstruction c. Image display and manipulation 3. CT Generations a. 1st b. 2nd c. 3rd d. 4th e. 5th f. 6th g. 7th	PowerPoint	
2	***CT Instrumentation*** 1. CT Imaging system a. X-ray tube and x-ray production b. Definition of the scanner c. X-ray beam filtration and collimation in CT d. X-ray emission spectra in CT e. CT detectors 2. CT computer system a. Data archiving b. Data manipulation c. Teleradiology	PowerPoint	
3	***Generating image in CT*** 1. Technique and protocols in CT 2. Generating topogram and slice in CT 3. Data acquisition terminology a. Ray b. View c. Profile 4. Generating CT numbers from linear attenuation coefficients	PowerPoint	

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4	***Data Acqusition Methods in CT: Conventional and Spiral*** 1. Single Slice Conventional slice by slice 2. Single Slice Spiral 3. Multislice conventional and spiral	PowerPoint	
5	***CT Reconstruction Methods*** 1. Back Projection 2. Iterative methods 3. Filtered back projection 4. Interpolation . 5. Image Brightness and Contrast 6. Windowing a. Window Level or Window Center(WL or WC) b. Window Width (WW)	PowerPoint	
6	***3D Rendering and MPR*** 1. SSD 2. VR 3. MIP and minIP 4. Conventional and curved MPR	PowerPoint	
7	***Image Quality in CT*** 1. Spatial resolution 2. Low Contrast Resolution 3. Temporal Resolution 4. Artifacts 5. QA procedures		

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8	***Patient Care and Radiation Protection in CT*** 1. X-ray interactions with matter 2. Stochastic and non-stochastic effects 3. CTDI 4. MSAD 5. DLP 6. ATCM 7. Shielding: lead and bismuth 8. Contrast administration: oral and intravenous 9. Contrast media adverse reactions	PowerPoint	
9	***Scanning of the Head and Facial Bones*** 1. Patient preparation 2. Protocol parameters and pathology demonstrated a. CT head with and without contrast b. CT head trauma c. CT of facial bones d. CT of orbits e. CT of TMJ f. CT of paranasal sinuses g. CT of temporal bone-internal auditory canals h. Stereotaxis	PowerPoint	
10	***Scanning of the Neck and Thorax*** 1. Patient preparation 2. Protocol parameters and pathology demonstrated a. CT thorax with or without contrast for mediastinal structures b. CT of thorax – air entrapment c. CT of thorax – asbestosis d. CT of thorax – High resolution protocol e. CT of thorax – trauma	PowerPoint	

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11	***Scanning of the Abdomen and Pelvis*** 1. Patient preparation 2. Protocol parameters and pathology demonstrated a. CT abdomen with and without contrast b. CT abdomen for pancreas c. CT abdomen for liver d. CT abdomen for renal system e. CT abdomen for adrenal glands f. CT abdomen for gastrointestinal system g. CT abdominal lymph nodes (disease staging) h. CT pelvis without contrast i. CT pelvis for male and female genitourinary system	PowerPoint	
12	***Scanning of the Spine and Musculoskeletal system*** 1. Patient preparation 2. Protocol parameters and pathology demonstrated a. CT spine b. CT post-myelogram c. CT wrist d. CT elbow e. CT shoulder f. CT pelvis g. CT hip h. CT knee i. CT foot and ankle	PowerPoint	
13	***CT Angiography*** 1. Patient preparation 2. Protocol parameters and pathology demonstrated a. CT head for circulus arteriosis cerebri (circle of Willis) b. CT head venogram c. CT neck for carotid arteries d. CT thorax for pulmonary embolism e. CT lower extremity venogram for DVT f. CT abdomen for aortic dissection g. CT liver – 3 and 4 phasic protocols h. CT pancreas 3 phasic protocol i. CT renal arteries j. CT Aorto-illiac runoff	PowerPoint	

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14	***Review and Final Exam*** 1. Review 2. **Final Exam (75 questions)**	Powerpoint	