FUNDAMENTALS OF RADIOGRAPHIC IMAGING — MDAS 1250

A. Course Description
   - Credits: 2.00
   - Lecture Hours/Week: 2.00
   - Lab Hours/Week: 0.00
   - OJT Hours/Week: 0
   - Prerequisites: None
   - Corequisites: None
   - MnTC Goals: None

   This course is designed to: 1. Prepare students for the MN State Examination for X-ray Operators. 2. Give students an overview of radiology technology and the importance it plays in the medical field. 3. Provide students with the necessary information to understand the following: Medical terminology as related to the specialty of radiology, the design and proper use of x-ray equipment, the principles of radiation safety with protection to both the operator and the patient, the importance of good, safe working habits. 4. Acquaint the students with common radiographic procedures. Prerequisites: None.

B. Course Effective Dates: 10/7/98 – Present

C. Outline of Major Content Areas
   - As noted on course syllabus

D. Learning Outcomes
   1. Apply the Inverse Square Law and calculate radiation intensity
   2. Define and explain radiographic contrast and density as they relate to the radiographic image
   3. Define effective-dose equivalent and annua occupational and non-occupational EDE limits
   4. Define ionizing radiation
   5. Describe history and development of the field of radiologic technology
   6. Explain differences between genetic and somatic effects of ionizing radiation
   7. Explain how mA, kVp,time,SID and heel-effect control affect contrast/density of radiographic image
   8. Identify radiological terms and proper usage
   9. Identify various beam- limiting devices and explain importance in reducing scattered
radiation
10. calculate radiation intensities
11. describe ALARA program
12. describe formation of the latent image
13. describe functions of the major parts of an x-ray machine
14. describe fundamental principles of radiation physics
15. describe interactions of radiation with intensifying screens
16. describe production of the manifest image
17. describe production of x-rays
18. describe radiation effects to the human body and embryo-fetus
19. describe x-ray filtration
20. distinguish the units of radiation exposure
21. distinguish types of intensifying screens
22. distinguish types of radiographic procedures
23. distinguish types of x-ray exposure factors
24. distinguish types of x-ray interactions with matter
25. identify 4 factors influencing the quantity of x-rays produced
26. identify and apply the exposures factors of mA, time, kVp and distance to related procedures
27. identify crucial Mn laws governing the use of ionizing radiation
28. identify major components of an x-ray processor
29. identify major parts of an x-ray machine
30. identify the major components in x-ray film
31. identify types of film artifacts
32. identify various chemical solutions found in x-ray processing
33. interpret tube rating charts
34. list 12 basic rules for radiation protection for the occupational worker
35. list 7 crucial properties of x-rays
36. list 8 rules for radiation protection to the patient against overexposure
37. list components of a quality assurance program
38. list darkroom quality control tests
39. list factors affecting the quality of an x-ray beam
40. perform basic positioning, set-up technique factors and demo film critique knowledge of common exams

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

F. Learner Outcomes Assessment
   As noted on course syllabus
G. Special Information
   None noted