RADIATION PROTECTION
Course Syllabus

Course Number: RADT-0140
OCAS Code: None
Course Length: 30 Hours
Career Cluster: Health Science
Career Pathway: Diagnostic Services
Career Major(s): Radiologic Technologist

Pre-requisite(s):

Course Description: Content presents an overview of the principles of radiation protection, including the responsibilities of the radiographer for patients, personnel and the public. Radiation health and safety requirements of federal and state regulatory agencies, accreditation agencies and health care organizations are incorporated.

Textbooks:


Online resources
Blackboard™

Course Objectives:
1. Identify and justify the need to minimize unnecessary radiation exposure of humans.
2. Explain the objectives of a radiation protection program.
3. Define radiation and radioactivity units of measurement.
4. Identify effective dose limits (EDL) for occupational and nonoccupational radiation exposure.
5. Describe the ALARA concept.
6. Identify the basis for occupational exposure limits.
7. Distinguish between perceived risk and comparable risk.
8. Describe the concept of the negligible individual dose (NID).
9. Identify ionizing radiation sources from natural and man-made sources.
10. Comply with legal and ethical radiation protection responsibilities of radiation workers.
11. Describe the relationship between irradiated area and effective dose.
12. Describe the theory and operation of radiation detection devices.
13. Identify appropriate applications and limitations for each radiation detection device.
14. Describe how isoeposure curves are used for radiation protection.
15. Identify performance standards for beam-limiting devices.
16. Describe procedures used to verify performance standards for equipment.
17. Describe the operation of various interlocking systems for equipment.
18. Identify conditions and locations evaluated in an area survey for radiation protection.
19. Distinguish between controlled and non-controlled areas and list acceptable exposure levels.
20. Describe "Radiation Area" signs and identify appropriate placement sites.
21. Describe the function of federal, state and local regulations governing radiation protection practices.
22. Describe the qualifications and responsibilities of a radiation safety officer.
23. Express the need and importance of personnel monitoring for radiation workers.
24. Describe personnel monitoring devices, including applications, advantages and limitations for each device.
25. Interpret personnel monitoring reports.
26. Compare values for individual effective dose limits for occupational radiation exposures (annual and lifetime).
27. Identify effective dose limits for the embryo and fetus in occupationally exposed women.
29. Demonstrate how the operation of various x-ray and ancillary equipment influences radiation safety and describe the potential consequences of equipment failure.
30. Perform calculations of exposure with varying time, distance and shielding.
31. Discuss the relationship between workload, energy, half-value layer (HVL), tenth-value layer (TVL), use factor and shielding design.
32. Identify emergency procedures to be followed during failures of x-ray equipment.
33. Demonstrate how time, distance and shielding can be manipulated to keep radiation exposures to a minimum.
34. Explain the relationship of beam-limiting devices to patient radiation protection.
35. Discuss added and inherent filtration in terms of the effect on patient dosage.
36. Explain the purpose and importance of patient shielding.
37. Identify various types of patient shielding and state the advantages and disadvantages of each type.
38. Use the appropriate method of shielding for a given radiographic or fluoroscopic procedure.
39. Explain the relationship of exposure factors to patient dosage.
40. Explain how patient position affects dose to radiosensitive organs.
41. Identify the appropriate image receptor that will result in an optimum diagnostic image with the minimum radiation exposure to the patient.
42. Select the immobilization techniques used to eliminate voluntary motion.
43. Describe the minimum source-to-tabletop distances for fixed and mobile fluoroscopic devices.
44. Apply safety factors for the patient, health care personnel and family members in the room during radiographic/fluoroscopic procedures.

All objectives are taken from the ASRT (American Society of Radiologic Technologists) curriculum © 2017

Teaching Methods:
The class will primarily be taught by the lecture and demonstration method and supported by various media materials to address various learning styles. There will be question and answer sessions over material covered in lecture and media presentations. Supervised lab time is provided for students to complete required projects.

Grading Procedures:
1. Students are graded on theory and lab practice and performance.
2. Each course must be passed with eighty (80%) percent or better.
3. Grading scale: A=90-100%, B=80-89%
4. Career Major grades established during coursework are a major criteria in successfully obtaining certification.

Description of Classroom, Laboratories, and Equipment:
Tulsa Technology Center campuses are owned and operated by Tulsa Technology Center School District No. 18. All programs provide students the opportunity to work with professionally certified instructors in modern, well-equipped facilities.
Available Certifications/ College Credit

The student may be eligible to take state, national or industry exam after completion of the program. Tulsa Tech students may be able to earn college credit based on their knowledge gained at Tech. The process of earning credit through Prior Learning Assessment (PLA) will be determined after completion with Tech and based on certification, credential or knowledge of the subject. See program counselor for additional information.

College Credit Eligibility:

All Tulsa Tech students (high school and adult) may have the opportunity to receive college credit upon completion of their program. Our College Relations office will work with students regarding the benefits of Prior Learning Assessments (PLA) toward an Associate of Applied Science (AAS) degree or a technical college certificate at area colleges. For more details call the College Relations office at 918.828.5000.