

Radiologic Technology Assessment Plan Rev. 6/15/2018

| Radiologic Technology  | 14-15 | 15-16 | 16-17 | 17-18 | 18-19 | 19-20 |
|--|-------|-------|-------|-------|-------|-------|
| <b>RADTB1A - Introduction to Radiologic Technology</b>   |       |       |       |       |       |       |
| • Upon completion the student will be able to: Explain the profession of radiologic technology, role of the radiographer and radiation use in medicine, <u>medical imaging career opportunities and professional organizations related to certification and accreditation.</u>               |       |       | X     |       |       |       |
| • Upon completion the student will be able to: Discuss and apply educational survival skills to successful academic and clinical education learning and progression.   |       | X     |       |       |       |       |
| • Upon completion the student will be able to: Examine the policies and procedures of academic and clinical education for the radiologic technology program.   | X     |       |       |       |       |       |
| • Upon completion the student will be able to: Describe the organizational structure of hospitals and imaging departments and describe the regulating agencies that affect the field of radiology.   |       |       |       |       | X     |       |
| • Upon completion the student will be able to: Describe the basic process of radiographic image formation and identify the basic components of radiographic/fluoroscopic equipment.  |       |       |       |       | X     |       |
| • Upon completion the student will be able to: Describe the basic principles of radiation safety and protection for patients, imaging personnel and others. <u>Recognize radiation safety regulations and guidelines.</u>  |       |       |       |       | X     |       |
| • Upon completion the student will be able to: Recognize and evaluate the systems of professional ethics, law and morals related to medicine and medical imaging. Explain the concepts of standard of care, informed consent, confidentiality, negligence and health information management. |       |       |       |       | X     |       |
| • Upon completion the student will be able to: Accurately use radiographic and medical terminology in verbal discussions and written assignments and examinations.   |       |       |       |       |       | X     |
| <b>RADTB1B - Patient Care</b>  |       |       |       |       |       |       |
| • Upon completion the student will be able to: Discuss effective communication styles for appropriate interactions with patients and the healthcare team.  | X     |       |       |       |       |       |
| • Upon completion the student will be able to: Demonstrate proper body mechanics techniques applicable to patient care.  |       | X     |       |       |       |       |
| • Upon completion the student will be able to: Describe, practice, and develop appropriate safety practices for patient and self in the healthcare environment.  |       |       | X     |       |       |       |
| • Upon completion the student will be able to: Compare and contrast infectious agents, discuss effective means of infection control and standard precautions and demonstrate asepsis, handwashing and isolation procedures.  |       |       |       |       | X     |       |
| • Upon completion the student will be able to: Demonstrate competency techniques used to assess vital signs.   |       |       |       |       | X     |       |
| • Upon completion the student will be able to: Describe the signs, symptoms and appropriate procedures for managing patients with various medical emergencies.   |       |       |       |       | X     |       |
| • Upon completion the student will be able to: Recognize basic types of contrast reactions and formulate appropriate responses for corrective action.  |       |       |       |       |       | X     |
| <b>RADTB2A - Radiographic Anatomy and Positioning 1</b>  |       |       |       |       |       |       |
| • Upon completion of the course, the student will be able to locate and identify specific anatomical structures used for radiographic positioning of the chest, abdomen, lower and upper extremities.  | X     |       |       |       |       |       |
| • Upon completion the student will be able to: Perform simulated radiographic examinations to demonstrate correct radiographic positioning of the chest, abdomen, lower and upper extremities.   |       | X     |       |       |       |       |
| • Upon completion the student will be able to: Observe and demonstrate radiation safety practices in manipulation and operation of equipment necessary to produce diagnostic radiographic images using tissue equivalent phantoms.   |       |       |       | X     |       |       |
| • Upon completion the student will be able to: Identify modifications and adapt procedures to produce diagnostic radiographic images for age specific, mentally and/or physically challenged, or uncooperative patients undergoing mobile examinations.                                      |       |       |       |       | X     |       |
| • Upon completion the student will be able to: Perform and analyze radiographic positions/procedures accomplished using radiographic and processing equipment and supplies. Evaluate outcomes and adapt procedures to produce quality radiographic images.                                   |       |       | X     |       |       |       |
| • Upon completion the student will be able to: Accurately use English, radiographic and medical terminology both verbally and in writing.  |       |       |       |       |       | X     |

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**RADTB2B - Radiographic Anatomy and Positioning 2**

|  |   |   |   |   |   |   |
|--|---|---|---|---|---|---|
| • Upon completion of the course, the student will be able to locate and identify specific anatomical structures used for radiographic positioning of the vertebral column, bony thorax, gastrointestinal, biliary and urinary systems, pediatric and geriatric exams.                  | X |   |   |   |   |   |
| • Upon completion the student will be able to: Perform simulated radiographic examinations to demonstrate correct radiographic positioning of the vertebral column, bony thorax, gastrointestinal, biliary, urinary systems, pediatric and geriatric exams.                            |   | X |   |   |   |   |
| • Upon completion the student will be able to: Observe and demonstrate radiation safety practices in manipulation and operation of equipment necessary to produce diagnostic radiographic images using tissue equivalents phantoms.  |   |   | X |   |   |   |
| • Upon completion the student will be able to: Identify modifications, and adapt procedures to produce diagnostic radiographic images for age specific, mentally and/or physically challenged, or uncooperative patients and patients undergoing mobile and fluoroscopic examinations. |   |   |   | X |   |   |
| • Upon completion the student will be able to: Perform and analyze radiographic positions/procedures accomplished using radiographic and processing equipment and supplies. Evaluate outcomes and adapt procedures to produce quality radiographic images.                             |   |   |   |   | X |   |
| • Upon completion the student will be able to: Accurately use English, radiographic and medical terminology both verbally and in writing.  |   |   |   |   |   | X |

**RADTB2C - Radiographic Anatomy and Positioning 3**

|  |   |   |   |   |   |   |
|--|---|---|---|---|---|---|
| • Upon completion the student will be able to: Locate and identify specific anatomical structures used for radiographic positioning of the head, skull, mammographic, angiographic and interventional procedures.  | X |   |   |   |   |   |
| • Upon completion the student will be able to: Perform simulated radiographic examinations to demonstrate correct radiographic positioning of the head and skull.  |   | X |   |   |   |   |
| • Upon completion the student will be able to: Observe and demonstrate radiation safety practices in manipulation and operation of equipment necessary to produce diagnostic radiographic images using tissue equivalent phantoms.                                   |   |   | X |   |   |   |
| • Upon completion the student will be able to: Identify modifications and adapt procedures to produce diagnostic radiographic images for age specific, mentally and/or physically challenged, or uncooperative patients and patients undergoing mobile examinations. |   |   |   | X |   |   |
| • Upon completion the student will be able to: Perform and analyze radiographic positions/procedures accomplished using radiographic processing and digital equipment. Evaluate outcomes and adapt procedures to produce quality radiographic images.                |   |   |   | X |   |   |
| • Upon completion the student will be able to: Differentiate between types of fluoroscopic image acquisition used in angiographic and interventional examinations.   |   |   |   |   | X |   |
| • Upon completion the student will be able to: Identify the equipment and supplies commonly used in angiographic and interventional examinations.  |   |   |   |   | X |   |
| • Upon completion the student will be able to: Identify contrast agents used in angiographic and interventional examinations, describe their administration, possible reactions, and emergency responses to adverse reactions.                                       |   |   |   |   |   | X |
| • Upon completion the student will be able to: Describe basic methods of sterile/aseptic techniques for angiographic and interventional radiographic examinations.   |   |   |   |   |   | X |

**RADTB3A - Radiographic Principles 1**

|   |  |   |   |   |   |   |
|---|--|---|---|---|---|---|
| • Upon completion of the course, the student will be able to solve mathematical equations, apply scientific notation, standard and metric system units to radiation principle calculations.                                     |  |   | X |   |   |   |
| • Upon completion the student will be able to: Manipulate imaging equipment while maintaining radiation safety and the principles of ALARA (as low as reasonably achievable).   |  |   |   | X |   |   |
| • Upon completion the student will be able to: Define and discuss the relationships of image acquisition and technical factors that affect image quality including image receptor exposure and contrast.                        |  |   |   |   | X |   |
| • Upon completion the student will be able to: Discuss radiographic and image processing equipment in terms of purpose, function, components, operation, applications and safety practices.                                     |  |   |   |   |   | X |
| • Upon completion the student will be able to: Analyze and evaluate outcomes of radiographic image production principles utilizing correct English and medical terminology following the performance of laboratory experiments. |  | X |   |   |   |   |

**RADTB3B - Radiographic Principles 2**

|  |  |  |   |   |   |  |
|--|--|--|---|---|---|--|
| • Upon completion of the course, the student will be able to solve mathematical problems, apply scientific notation, standard and metric system units to radiation principle calculations.                         |  |  |   |   | X |  |
| • Upon completion the student will be able to: Analyze the image acquisition and technical factors affecting radiographic quality including image receptor exposure, contrast, spatial resolution and distortion.  |  |  |   | X |   |  |
| • Upon completion the student will be able to: Manipulate radiographic and fluoroscopic equipment correctly while maintaining radiation safety and the principles of ALARA (as low as reasonably achievable).      |  |  |   | X |   |  |
| • Upon completion the student will be able to: Perform experiments with radiographic, mobile fluoroscopic and image processing equipment to evaluate the quality and technical outcomes of radiographic exposures. |  |  |   |   | X |  |
| • Upon completion the student will be able to: Discuss the equipment construction and operation of fixed and mobile radiographic and fluoroscopic equipment and equipment quality assurance and control.           |  |  | X |   |   |  |

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**RADTB4A - Introduction to Clinical Education**

|   |   |   |   |  |   |   |
|---|---|---|---|--|---|---|
| • Upon completion of the course, the student will be able to demonstrate proper radiation protection safety procedures for imaging personnel, the patient and other individuals within the radiation environment while maintaining the ALARA (as low as reasonably achievable) concept. | X |   |   |  | X |   |
| • Upon completion the student will be able to: Demonstrate proper body mechanics, lifting and transferring techniques within the skills lab, radiation laboratory and clinical education center.  |   | X |   |  | X |   |
| • Upon completion the student will be able to: Communicate effectively while maintaining confidentiality guidelines and using accurate radiographic and medical terminology, both verbally and non-verbally.  |   |   | X |  |   | X |

**RADTB4B - Clinical Education 1**

|  |   |   |   |   |   |  |
|--|---|---|---|---|---|--|
| • Upon completion of the course, the student will be able to demonstrate proper radiation protection safety procedures for imaging personnel, the patient, and other individuals within the radiation environment while maintaining the ALARA (as low as reasonably achievable) concept. | X |   |   |   |   |  |
| • Upon completion the student will be able to: Produce medical images of suitable diagnostic quality under direct supervision, safely and accurately: a. Position patients/anatomical structure b. Manipulate and operate radiographic equipment c. Process radiographic images          |   | X |   |   |   |  |
| • Upon completion the student will be able to: Communicate effectively while maintaining confidentiality guidelines and using accurate radiographic and medical terminology, both verbally and non-verbally.   |   |   | X |   |   |  |
| • Upon completion the student will be able to: Demonstrate proper body mechanics, lifting and transferring techniques in the clinical education center.  |   |   |   | X |   |  |
| • Perform competency exams to demonstrate radiographic procedures as defined by the clinical competency assessment process.  |   |   |   |   | X |  |

**RADTB5 - Radiation Physics**

|  |   |   |   |   |   |   |
|--|---|---|---|---|---|---|
| • Upon completion the student will be able to: Solve mathematical problems that require identifying key data (i.e. word problems, lists, tables, experiments or graphs) and utilizing formulas for conversions, ratios and radiation equipment performance. Apply scientific notation, standard and metric system units to radiation and physics calculations. |   |   |   | X |   |   |
| • Upon completion the student will be able to: Illustrate and explain the structure of the atom, atomic nomenclature, nature of radiation and radioactivity and characteristics of the electromagnetic spectrum.   | X |   |   |   |   |   |
| • Upon completion the student will be able to: Identify the characteristics of direct and alternating currents and x-ray circuits and illustrate examples of each type.  |   |   |   | X |   |   |
| • Upon completion the student will be able to: Describe and identify the components and operation of the x-ray generator and circuit and evaluate their output, dose and efficiency.   |   |   |   |   | X |   |
| • Upon completion the student will be able to: Discuss the purpose, function, components, types, applications and safety practices for permanent and mobile installations of radiographic and fluoroscopic equipment.  |   |   |   |   | X |   |
| • Upon completion the student will be able to: Discuss and analyze the types of x-ray production, conditions necessary for production, x-ray emission spectra and factors effecting emission spectra and production efficiency.  |   |   |   |   |   | X |
| • Upon completion the student will be able to: Describe and illustrate x-ray interaction with matter and discuss the clinical significance of the interactions in diagnostic imaging.  |   |   | X |   |   |   |
| • Upon completion the student will be able to: Describe the components of a quality control program, perform and analyze quality assurance tests for radiographic equipment and determine acceptability of performance and corrective actions necessary for common malfunctions.   |   | X |   |   |   |   |

**RADTB6 - Clinical Education 2**

|  |   |   |   |   |   |   |
|--|---|---|---|---|---|---|
| • Upon completion of the course, the student will be able to Demonstrate proper radiation protection safety procedures for imaging personnel, the patient and other individuals within the radiation environment while maintaining the ALARA (as low as reasonably achievable) concept.                            | X |   |   |   |   | X |
| • Upon completion the student will be able to: Produce medical images of suitable diagnostic quality under direct supervision, safely and accurately. a. Position patients/anatomical structures b. Manipulate and operate radiographic and fluoroscopic equipment c. Process radiographic and fluoroscopic images |   | X |   |   |   |   |
| • Upon completion the student will be able to: Communicate effectively while maintaining confidentiality guidelines and accurate radiographic medical terminology, both verbally and non-verbally.   |   |   | X | X |   |   |
| • Upon completion the student will be able to: Assess medical images for correct exposure, positioning, and radiographic quality as defined by the radiographic case study process.  |   |   |   | X |   |   |
| • Upon completion the student will be able to: Perform competency exams to demonstrate correct radiographic procedures as defined by the clinical competency assessment process  |   |   |   |   | X |   |

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**RADTB7 - Clinical Education 3**

|   |   |   |   |   |   |  |
|---|---|---|---|---|---|--|
| • Upon completion of the course, the student will be able to demonstrate proper radiation protection safety procedures for imaging personnel, the patient and other individuals within the radiation environment while maintaining the ALARA (as low as reasonably achievable) concept.                       | X |   |   |   |   |  |
| • Upon completion the student will be able to: Produce medical images of suitable diagnostic quality under direct and indirect supervision, safely and accurately: a) Position patients/anatomical structures; and b) Manipulate and operate radiographic and fluoroscopic equipment; c) process radiographic |   | X |   |   |   |  |
| • Upon completion the student will be able to: Communicate effectively while maintaining confidentiality guidelines and accurate radiographic and medical terminology, both verbally and non-verbally.  |   |   | X |   |   |  |
| • Upon completion the student will be able to: Assess medical images for correct exposure, positioning, and radiographic quality as defined by the radiographic case study process.   |   |   |   | X |   |  |
| • Upon completion the student will be able to: Perform competency exams to demonstrate correct radiographic procedures as defined by the clinical competency assessment process.  |   |   |   |   | X |  |

**RADTB9A - Sectional Anatomy for Medical Imaging**

|  |   |   |   |   |   |   |
|--|---|---|---|---|---|---|
| • Upon completion the student will be able to: Describe the major components of the computed tomography and magnetic resonance imaging equipment   | X |   |   |   |   |   |
| • Upon completion the student will be able to: Explain the data acquisition process and operations for computed tomography and magnetic resonance imaging equipment.   |   | X |   |   |   |   |
| • Upon completion the student will be able to: Differentiate the superior, inferior, and lateral boundaries of each major anatomical section.  |   |   | X |   |   |   |
| • Upon completion the student will be able to: Identify and describe the structural anatomy components of each major body section (head, thorax, spine, abdomen, and pelvis) in transverse, coronal, and sagittal perspectives on anatomic diagrams, slides, cadaver slices, and medical images. |   |   |   | X |   |   |
| • Upon completion the student will be able to: Discuss the interrelationships of major organs and vessels in the head, thorax, spine, abdomen, and pelvic regions of the body.   |   |   |   |   | X |   |
| • Upon completion the student will be able to: Describe routine planar anatomy and adapt this knowledge to three dimensional or sectional perspectives.  |   |   |   |   |   | X |

**RADTB10 - Clinical Education 4**

|   |   |   |  |   |   |  |
|---|---|---|--|---|---|--|
| • Upon completion of the course, the student will be able to demonstrate proper radiation protection safety procedures for imaging personnel, the patient and other individuals within the radiation environment while maintaining the ALARA (as low as reasonably achievable) concept.                       | X |   |  |   |   |  |
| • Upon completion the student will be able to: Produce medical images of suitable diagnostic quality under direct and indirect supervision, safely and accurately. a. Position patients/anatomical structures b. Manipulate and operate radiographic and fluoroscopic equipment c. Process radiographic and f |   | X |  |   |   |  |
| • Upon completion the student will be able to: Communicate effectively while maintaining confidentiality guidelines and accurate radiographic and medical terminology, both verbally and non-verbally.  |   |   |  | X |   |  |
| • Upon completion the student will be able to: Assess medical images for correct exposure, positioning, pathology, and radiographic quality as defined by the radiographic case study process.  |   |   |  | X |   |  |
| • Upon completion the student will be able to: Perform competency exams to demonstrate correct radiographic and fluoroscopic procedures as defined by the clinical competency assessment process.   |   |   |  |   | X |  |

**RADTB11 - Radiographic Pathology**

|   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|
| • Upon completion of the course, the student will be able to effectively use medical and radiographic terminology in describing various aspects of pathologic conditions.                                 | X |   |   |   |   |   |
| • Upon completion the student will be able to: Describe the normal anatomy and physiology of selected systems of the human body.  |   | X |   |   |   |   |
| • Upon completion the student will be able to: Describe the disease processes for various pathologic conditions.  |   |   | X |   |   |   |
| • Upon completion the student will be able to: Identify imaging procedure(s) of choice for selected pathological conditions.  |   |   |   | X |   |   |
| • Upon completion the student will be able to: Identify key features on diagnostic medical images that are representative of selected pathologic conditions.  |   |   |   |   | X |   |
| • Upon completion the student will be able to: Identify the role of medical imaging in diagnosing and treating diseases of the human body.  |   |   |   |   |   | X |
| • Upon completion the student will be able to: Describe modifications of technical factors, patient care practices, and radiographic positioning that are recommended for selected pathologic conditions. |   |   |   |   |   | X |

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**RADTB12 - Radiobiology and Radiation Protection**

|   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|
| • Upon completion of the course, the student will be able to describe the as low as reasonably achievable (ALARA) concept and its application to <u>reducing radiation exposure to humans.</u>  | X |   |   |   |   |   |
| • Upon completion the student will be able to: Differentiate between somatic, genetic , stochastic (probabilistic) and non-stochastic (deterministic) effects of <u>radiation exposure in human cells.</u>  | X | X |   |   |   |   |
| • Upon completion the student will be able to: Define, calculate and use radiation and radioactive units of measurement including the theory and <u>operation of radiation detection devices.</u>   |   |   | X |   |   |   |
| • Upon completion the student will be able to: Interpret the dose-response curves and their application to radiation protection programs.   |   |   |   | X |   |   |
| • Upon completion the student will be able to: Describe and explain how exposure factors such as time, distance and shielding can be manipulated to <u>keep radiation exposures to a minimum for patients, technologists and health care providers.</u> | X |   |   |   | X |   |
| • Upon completion the student will be able to: Compare the practical application of safety factors for the patient(and others) during general radiography <u>and fluoroscopy, and their mobile applications .</u>                                       |   |   |   |   |   | X |

**RADTB13 - Clinical Education 5**

|  |   |   |   |   |   |   |
|--|---|---|---|---|---|---|
| • Upon completion of the course, the student will be able to demonstrate proper radiation protection safety procedures for imaging personnel, the patient <u>and other individuals within radiation environment while maintaining the ALARA (As Low As Reasonably Achievable) concept.</u> | X |   |   |   |   | X |
| • Produce medical images of suitable quality under direct and indirect supervision , safely and accurately: a. position patients/anatomical structures b. <u>manipulate and operate radiographic and fluoroscopic equipment c. process radiographic and fluorosco</u>                      |   | X |   |   |   |   |
| • Upon completion the student will be able to: Communicate effectively while maintaining confidentiality guidelines and accurate radiographic and medical <u>terminology, both verbally and non-verbally.</u>  |   |   | X |   |   |   |
| • Upon completion the student will be able to: Assess medical images for correct exposure, positioning, and radiographic quality.  |   |   |   | X |   |   |
| • Upon completion the student will be able to: Perform competency exams to demonstrate correct radiographic procedures as defined by the competency <u>assessment process.</u>   |   |   |   |   | X |   |

**RADTB30 - Principles of Venipuncture**

|  |   |   |   |   |   |   |
|--|---|---|---|---|---|---|
| • Upon completion the student will be able to:Effectively use medical and pharmacological terminology in describing various aspects of venipuncture and <u>uses of radiopaque contrast media.</u>  | X |   |   |   |   |   |
| • Upon completion the student will be able to: Identify and describe the anatomy and physiology of venipuncture sites including absorption and excretion, <u>routes of administration of medications and radiopaque contrast media.</u>                                |   |   |   | X |   |   |
| • Upon completion the student will be able to: Describe the methods and demonstrate the techniques used by radiographers in the administration of <u>contrast agents.</u>  |   | X |   |   |   |   |
| • Upon completion the student will be able to: Describe pharmacokinetic and pharmacodynamic principles of drugs and radiopaque contrast media <u>including ionic and non-ionic compounds.</u>  |   |   |   |   | X |   |
| • Upon completion the student will be able to: Specify the correct forms and uses of medical record documentation in radiography.  |   |   |   |   | X |   |
| • Upon completion the student will be able to: Identify, describe and document complications associated with common intravenous drug therapy for <u>radiopaque contrast media and appropriate actions to mitigate complications or actions to treat complications.</u> |   |   |   |   |   | X |
| • Upon completion the student will be able to: Demonstrate competency by performing ten successful venipuncture techniques on human beings in the <u>laboratory setting.</u>   |   |   | X |   |   |   |