

**LIMITED MEDICAL RADIOLOGIC TECHNOLOGIST WITH MEDICAL ASSISTING SKILLS**

Blended Delivery - Offered at MCA Campus only

**Program Objective:** Limited Medical Radiologic Technologist with Medical Assisting Skills - Certificate Program students are trained to perform routine diagnostic X-ray exams of the skull, extremities and vertebral column. The emphasis of training is on the anatomy of the human body and the proper positioning of the patient to achieve a quality radiograph. Training also includes the history, theory and application of diagnostic X-rays and their effect upon the human body. Students learn the theory of radiation production and the proper procedures and techniques to reduce radiation exposure to the patient and themselves. Students will also learn the operation, maintenance and quality control of the radiology equipment. Students learn medical terminology, professionalism, medical office skills to include patient triage, patient care, assisting physicians, basic phlebotomy technique, and basic pharmacology. These skills will prepare the student to become an effective member of the health care team and provide quality care to their patients. Graduates will have obtained the knowledge and skills necessary to pass the state licensing exam and find employment in a variety of medical clinics and physician's offices. The program objectives are achieved through classroom and clinical hands on training as well as professional development.

**Program Requirements:** Each program participant must have a high school diploma or GED and should be able to read and write English. All entrants must pass the Scholastic Level Exam with a minimum score of 16. The participant should also have good coordination, be neat, professional, and be able to lift 40 pounds.

**\*NOTE:** Any person convicted of a misdemeanor or felony offense under various titles of the Texas Penal Code may be denied a State LMRT license. Students are responsible for inquiring with the appropriate agencies about current requirements and their eligibility to sit for the state examination prior to enrolling.

**Program Length:** Overall program length is 1,608 total clock hours, 60 weeks in length.

**Delivery Method:** Blended Class delivery

COURSE CODE	COURSE TITLE	LECTURE HOURS	LAB HOURS	EXTERN HOURS	TOTAL HOURS	SEMESTER CREDITS
<b>Module I</b>						
MSS130	Master Student/Study Skills	8	0	0	8	.5
HIP130	HIPAA/OSHA/Infection Control	10	0	0	10	.5
OAPT130	Overview of Anatomy, Physiology and Medical Terminology	48	0	0	48	3.0
	<b>Total Module I</b>	<b>66</b>	<b>0</b>	<b>0</b>	<b>66</b>	<b>4.0</b>
<b>Module II</b>						
RAD 301	Introduction to Radiologic Science / Ethics and Law/Radiologic Terminology	32	0	0	32	2.0
RAD 302	Radiographic Math and Calculations / Radiation Production and Exposure	64	0	0	64	4.0
	<b>Total Module II</b>	<b>96</b>	<b>0</b>	<b>0</b>	<b>96</b>	<b>6.0</b>
<b>Module III</b>						
RAD303	Radiation Protection & Safety/Radiation Biology	64	0	0	64	4.0
RAD304	A & P, Pathology and Medical Terminology of the Endocrine, Urinary, Reproductive, and Integumentary Systems	32	0	0	32	2.0
	<b>Total Module III</b>	<b>96</b>	<b>0</b>	<b>0</b>	<b>96</b>	<b>6.0</b>
<b>Module IV</b>						
RAD305	A & P, Pathology and Medical Terminology of the Upper Extremities	32	0	0	32	2.0
RAD306	Radiographic Procedures, and Image Analysis of the Upper Extremity Laboratory	0	64	0	64	2.0
	<b>Total Module IV</b>	<b>32</b>	<b>64</b>	<b>0</b>	<b>96</b>	<b>4.0</b>
<b>Module V</b>						
RAD307	Imaging Equipment and Bone Density	32	0	0	32	2.0
RAD308	A&P, Pathology and Medical Terminology of the Respiratory and Cardiovascular Systems	32	0	0	32	2.0
CSP130	Customer Service and Professional Skills	16	16	0	32	1.5
	<b>Total Module V</b>	<b>80</b>	<b>16</b>	<b>0</b>	<b>96</b>	<b>5.5</b>

COURSE CODE	COURSE TITLE	LECTURE HOURS	LAB HOURS	EXTERN HOURS	TOTAL HOURS	SEMESTER CREDITS
<b>Module VI</b>						
RAD309	A & P, Pathology and Medical Terminology of the Lower Extremity and Pelvis	32	0	0	32	2.0
RAD310	Radiographic Procedures and Image Analysis of the Lower Extremity and Pelvis Laboratory	0	64	0	64	2.0
<b>Total Module VI</b>		<b>32</b>	<b>64</b>	<b>0</b>	<b>96</b>	<b>4.0</b>
<b>Module VII</b>						
RAD311	Digital Image Acquisition, Display and Film/Screen Image Production and Evaluation	48	0	0	48	3.0
RAD312	A&P, Pathology and Medical Terminology of the Muscular Systems, Nervous System, Special Senses	48	0	0	48	3.0
<b>Total Module VII</b>		<b>96</b>	<b>0</b>	<b>0</b>	<b>96</b>	<b>6.0</b>
<b>Module VIII</b>						
RAD313	A&P, Pathology and Medical Terminology of the Chest, Bony Thorax, Digestive System and Abdomen	48	0	0	48	3.0
RAD314	Radiographic Procedures and Image Analysis of the Chest, Bony Thorax, and Abdomen	0	48	0	48	1.5
<b>Total Module VIII</b>		<b>48</b>	<b>48</b>	<b>0</b>	<b>96</b>	<b>4.5</b>
<b>Module IX</b>						
RAD315	A&P, Pathology and Medical Terminology of the Vertebral Column	32	0	0	32	2.0
RAD316	Radiographic procedures and image analysis of the Vertebral Column	0	64	0	64	2.0
<b>Total Module IX</b>		<b>32</b>	<b>64</b>	<b>0</b>	<b>96</b>	<b>4.0</b>
<b>Module X</b>						
RAD317	A & P, Pathology and Medical Terminology of the Skull and Facial Bones	48	0	0	48	3.0
RAD318	Radiographic Procedures and Image Analysis of the Skull and Facial Bones Laboratory	0	48	0	48	1.5
<b>Total Module X</b>		<b>48</b>	<b>48</b>	<b>0</b>	<b>96</b>	<b>4.5</b>
<b>Module XI</b>						
PCM302	Patient Care and Medical Assisting Skills	16	32	0	48	2.0
CTR301	Cert Review	16	44	0	60	2.5
RXS301	Radiology Externship	0	0	570	570	12.5
<b>Total Module XII</b>		<b>32</b>	<b>76</b>	<b>570</b>	<b>678</b>	<b>17.0</b>
<b>Totals Hours/Credits</b>		<b>658</b>	<b>380</b>	<b>570</b>	<b>1608</b>	<b>65.5</b>

**Total Hours = 1608 Total Semester Credits = 65.5**

NOTE: Students are required to successfully pass all courses with a minimum GPA of 2.0 within the maximum allowable time frame. Upon successful completion of all course work, externship, and payment of all monies due, the student is awarded a Certificate of Completion.

**Course Descriptions:**

Course descriptions include the course number, title, and synopsis, a listing of lecture, laboratory, externship hours, total clock hours and academic credits. For example, the listing “15/30/0/45/2.0” indicates that the course consists of 15 hours of lecture, 30 hours of laboratory, 0 externship hours, 45 total clock hours and 2.0 academic credits.

*Note: Students must successfully complete all courses before entering externship. Courses may not be offered in the sequence list below.*

<b>MSS130</b>	<b>MASTER STUDENT/STUDY SKILLS</b>	<b>8/0/0/8/0.5</b>
Students will become familiar with basic study and learning skills to include learning styles, goal setting, memorization techniques, reading comprehension, note taking, test taking, critical thinking, effective communication diversity, and technology. <b>Prerequisite: None</b>		
<b>HIP130</b>	<b>HIPAA/OSHA/INFECTION CONTROL</b>	<b>10/0/0/10/5</b>
Students will learn about the Health Insurance Portability and Accountability Act (HIPAA). This course will identify rights for individuals and the processes that health care providers must implement to support individual rights. Students must demonstrate knowledge of the rules for the use and disclosure of information. Students will learn about transmission of disease, hand washing techniques and gloving. This course will ensure that students are aware of biohazards and airborne pathogens, including infection control procedures and laboratory safety. Students must demonstrate infection control procedures and laboratory safety. <b>Prerequisite: None</b>		
<b>OAPT 130</b>	<b>OVERVIEW OF ANATOMY, PHYSIOLOGY AND MEDICAL TERMINOLOGY</b>	<b>48/0/0/48/3.0</b>
Students will learn and Identify basic structures, functions and dysfunctions of the body, as well as medical terminology, abbreviations and symbols that are necessary tools for building a medical vocabulary. This course covers general treatment of the sensory, skeletal and muscular, nervous, endocrine, digestive, respiratory, Circulatory, Urinary and reproductive, and integumentary systems. <b>Prerequisite: None.</b>		
<b>RAD301</b>	<b>INTRODUCTION TO RADIOLOGIC SCIENCE / ETHICS AND LAW/RADIOLOGIC TERMINOLOGY</b>	<b>32/0/0/32/2.0</b>
The student will study the history of radiology and professional organizations that are a part of radiology Students will create a basic resume. They will learn the Code of Ethics and how it applies in today’s workplace. Explain the laws that impact the LMRT and the makeup of a modern radiology department and its functions with an introduction to x-ray equipment and the technical aspects. <b>Prerequisite: None</b>		
<b>RAD302</b>	<b>RADIOGRAPHIC MATH AND CALCULATIONS / RADIATION PRODUCTION AND EXPOSURE</b>	<b>64/0/0/64/4.0</b>
Content imparts knowledge to the students for performing functions with fractions and decimals. Students will learn to solve problems involving fractions (proper and improper) ratios and proportions and will learn how to solve word problems. Content is also designed to simplify algebraic expressions and convert units within the SI system, reading and solving word problems. Students will explain production of x-rays in the tube (Bremsstrahlung vs. Characteristics); distinguish between density, contrast, and the factors that control them. The will understand the fundamentals of photon interactions with matter. They will have a basic understanding of energy, wavelength and frequency. They will define total filtration (inherent and added) and its effect on the primary beam, compare factors in technique (mA, time, kVp, and distance) and their related effects on density and contrast. The student will learn X-Ray interactions with matter (Photoelectric, Compton, and Coherent). Apply conversion factors for changes with distance, grids, image receptors, reciprocity law and 15% rule. <b>Prerequisite: Mod I</b>		
<b>RAD303</b>	<b>RADIATION PROTECTION &amp; SAFETY/RADIATION BIOLOGY</b>	<b>64/0/0/64/4.0</b>
Content presents an overview of the principles of radiation protection, including the responsibilities of the radiographer for patients, personnel, and the general public. Radiation health and safety requirements of federal and state regulatory agencies, accreditation agencies, and health care organizations are incorporated. <b>Prerequisite: Mod I</b>		
<b>RAD304</b>	<b>A &amp; P, PATHOLOGY AND MEDICAL TERMINOLOGY OF THE ENDOCRINE, URINARY, REPRODUCTIVE, AND INTEGUMENTARY SYSTEMS</b>	<b>32/0/0/32/2.0</b>
The student will learn anatomy and physiology of the upper extremities as well as major components of the endocrine, urinary, and reproductive systems. Students will also learn to identify the anatomical landmarks associated with these regions. Medical terminology specific to this anatomical area will be discussed, as well as provide a knowledge base necessary to define pathologic conditions. <b>Research Assignment 1 - Career Services Prep. Prerequisite: Mod I</b>		

<b>RAD305</b>	<b>A &amp; P, PATHOLOGY AND MEDICAL TERMINOLOGY OF THE UPPER EXTREMITIES</b>	<b>32/0/0/32/2.0</b>
The student will learn anatomy and physiology of the upper extremities and structures associated with these regions. Medical terminology specific to this anatomical area will be discussed, as well as provide a knowledge base necessary to define pathologic conditions. <b>Research Assignment 2</b> – Career Services Prep. <b>Prerequisite: Mod I</b>		
<b>RAD306</b>	<b>RADIOGRAPHIC PROCEDURES AND IMAGE ANALYSIS OF THE UPPER EXTREMITY LABORATORY</b>	<b>0/64/0/64/2.0</b>
This course will teach the student how to correctly position the anatomy of the upper limb to include the shoulder girdle and acromioclavicular joints in order to produce quality diagnostic radiographic images. This course will also teach the student how to analyze the images for radiographic and diagnostic quality. <b>Prerequisite: Mod I</b>		
<b>RAD307</b>	<b>IMAGING EQUIPMENT AND BONE DENSITY</b>	<b>32/0/0/32/2.0</b>
Students will be introduced to the ionization of matter and its various interactions. Identify the units of radiation as well as explain the electromagnetic spectrum and its makeup. They will learn and explain the radiographic tube construction, the x-ray table, circuitry, generators and their purposes. They will have a basic knowledge of Electricity. They will understand the factors that affect and control the recorded image. Students will learn how differences in IR's and grids interact with x-rays. Explain the basic construction of grids and their effect on density and contrast. <b>Prerequisite: Mod I</b>		
<b>RAD308</b>	<b>A&amp;P, PATHOLOGY AND MEDICAL TERMINOLOGY OF THE RESPIRATORY AND CARDIOVASCULAR SYSTEMS</b>	<b>32/0/0/32/2.0</b>
The student will learn anatomy and physiology of the respiratory and cardiovascular systems, and structures associated with these regions. Medical terminology specific to this anatomical area will be discussed, as well as provide a knowledge base necessary to define pathologic conditions. <b>Research Assignment 3</b> – Career Services Prep. <b>Prerequisite: Mod I</b>		
<b>CSP130</b>	<b>CUSTOMER SERVICE AND PROFESSIONAL SKILLS</b>	<b>16/16/0/32/1.5</b>
This course will teach the student about professionalism, including work-place behaviors that result in positive business relationships. Students will learn goal-setting, stress-management, time-management, professional dress, etiquette, diversity in the work place relationships, excellent customer service, communication at work, conflict management, job search skills, building resumes, and interview techniques. <b>Prerequisite: Mod I</b>		
<b>RAD309</b>	<b>A &amp; P, PATHOLOGY AND MEDICAL TERMINOLOGY OF THE LOWER EXTREMITIES AND PELVIS</b>	<b>32/0/0/32/2.0</b>
The student will learn anatomy and physiology of the lower extremities and structures associated with these regions. Medical terminology specific to this anatomical area will be discussed, as well as provide a knowledge base necessary to define pathologic conditions <b>Prerequisite: Mod I</b>		
<b>RAD310</b>	<b>RADIOGRAPHIC PROCEDURES AND IMAGE ANALYSIS OF THE LOWER EXTREMITY AND PELVIS LABORATORY</b>	<b>0/64/0/64/2.0</b>
This course will teach the student how to correctly position the anatomy of the lower limb including the pelvic girdle in order to produce quality diagnostic radiographic images. This course will also teach the student how to analyze the images for radiographic and diagnostic quality. <b>Prerequisite: Mod I</b>		
<b>RAD311</b>	<b>DIGITAL IMAGING ACQUISITION, DISPLAY AND FILM/SCREEN IMAGE PRODUCTION AND EVALUATION</b>	<b>64/0/0/64/4.0</b>
Content imparts an understanding of the components, principles and operation of digital imaging systems found in diagnostic radiology. Factors that impact image acquisition, display, archiving and retrieval are discussed. Principles of digital system quality assurance and maintenance are presented. Students will receive an overview of automatic film processing and film sensitometry. <b>Prerequisite: Mod I</b>		
<b>RAD312</b>	<b>A&amp;P, PATHOLOGY AND MEDICAL TERMINOLOGY OF THE MUSCULAR SYSTEMS, NERVOUS SYSTEM, AND SPECIAL SENSES.</b>	<b>32/0/0/32/2.0</b>
Student will learn the anatomy and physiology of the muscular systems, nervous systems, and special senses, along with structures associated with these regions. Medical terminology specific to this anatomical area will be discussed, as well as provide a knowledge base necessary to define pathologic conditions. <b>Research Assignment 4</b> – Career Services Prep. <b>Prerequisite: Mod I</b>		

<b>RAD313</b>	<b>A&amp;P, PATHOLOGY, AND MEDICAL TERMINOLOGY OF THE CHEST, BONY THORAX, DIGESTIVE SYSTEM AND ABDOMEN.</b>	<b>48/0/0/48/3.0</b>
The student will learn anatomy and physiology of the chest, bony thorax, digestive system, and abdomen, along with structures associated with these regions. Medical terminology specific to this anatomical area will be discussed, as well as provide a knowledge base necessary to define pathologic conditions. <b>Research Assignment 5 – Career Services Prep. Prerequisite: Mod I</b>		
<b>RAD314</b>	<b>RADIOGRAPHIC PROCEDURES AND IMAGE ANALYSIS OF THE CHEST, BONY THORAX, DIGESTIVE SYSTEM AND ABDOMEN LABORATORY.</b>	<b>0/48/0/48/1.5</b>
This course will teach the student how to correctly position the anatomy of the chest, bony thorax, digestive system and abdomen, in order to produce quality diagnostic radiographic images. This course will also teach the student how to analyze the images for radiographic and diagnostic quality. <b>Prerequisite: Mod I</b>		
<b>RAD315</b>	<b>A&amp;P, PATHOLOGY AND MEDICAL TERMINOLOGY OF THE VERTEBRAL COLUMN</b>	<b>32/0/0/32/2.0</b>
The student will learn anatomy and physiology of the vertebral column and structures associated with these regions. Medical terminology specific to this anatomical area will be discussed, as well as provide a knowledge base necessary to define pathologic conditions. <b>Prerequisite: Mod I</b>		
<b>RAD316</b>	<b>RADIOGRAPHIC PROCEDURES AND IMAGE ANALYSIS OF THE VERTEBRAL COLUMN LABORATORY</b>	<b>0/64/0/64/2.0</b>
This course will teach the student how to correctly position the anatomy of the vertebral column and sacrum and coccyx in order to produce quality diagnostic radiographic images. This course will also teach the student how to analyze the images for radiographic and diagnostic quality. <b>Prerequisite: Mod I</b>		
<b>RAD317</b>	<b>A&amp;P, PATHOLOGY AND MEDICAL TERMINOLOGY OF THE SKULL AND FACIAL BONES</b>	<b>48/0/0/48/3.0</b>
The student will learn anatomy and physiology of the skull, facial bones, and structures associated with these regions. Medical terminology specific to this anatomical area will be discussed, as well as provide a knowledge base necessary to define pathologic conditions. <b>Prerequisite: Mod I</b>		
<b>RAD318</b>	<b>RADIOGRAPHIC PROCEDURES AND IMAGE ANALYSIS OF THE SKULL AND FACIAL BONES LABORATORY</b>	<b>0/48/0/0/48/1.5</b>
This course will teach the student how to correctly position the anatomy of the skull, facial bones and sinuses in order to produce quality diagnostic radiographic images. This course will also teach the student how to analyze the images for radiographic and diagnostic quality. <b>Prerequisite: Mod I</b>		
<b>PCM302</b>	<b>PATIENT CARE AND MEDICAL ASSISTING SKILLS</b>	<b>16/32/0/48/2.0</b>
Students will learn basic patient care skills, phlebotomy, medication administration, basic pharmacology, vital signs, triage, labs, and CPR. <b>Prerequisite: Mod I – X</b>		
<b>CTR301</b>	<b>CERT REVIEW</b>	<b>16/44/0/60/2.5</b>
This course provides students the opportunity to review for the Texas Limited Examination in Medical Radiologic Technology so they may procure a permanent Texas Limited Medical Radiologic Technologist license. This is done through using review materials as well as utilizing practice exams in all areas of the test. The students will also fill out an application for the Temporary Limited Medical Radiologic Technologist license. <b>Prerequisite: Mod I – X</b>		
<b>RXS301</b>	<b>RADIOLOGY EXTERNSHIP</b>	<b>0/0/570/570/12.5</b>
This course provides placement of the student in a clinical setting in which the student will have the opportunity to gain hands-on experience as a clinical X-ray technologist. Students will utilize the knowledge and demonstrate skills learned in the classroom and laboratory. Prerequisites: Completion of all limited medical radiologic technologist classes, current on financial obligations to the school, and recommendation of the instructor and externship coordinator. <b>** LMRT Externship must be completed within 180 days. ** Prerequisite: I – X</b>		