

DIAGNOSTIC MEDICAL IMAGING (RADIOLOGIC TECHNOLOGY)

Radiologic Technologists make up the third-largest group of health care professionals—surpassed in number only by physicians and nurses. A primary responsibility of many technologists is to create images of patients' bodies using medical equipment. This helps doctors diagnose and treat diseases and injuries.

The Diagnostic Medical Imaging program (DMI) is dedicated to providing high-quality education and clinical practicum to qualified students. It is responsive to the diverse needs of the local medical community. It specializes in the education and training that lead to entry-level employment as a Radiologic Technologist and an Associate in Science Degree. The program emphasizes the necessity of professional development and life-long learning as a competent and ethical health care professional.

This program requires the student to participate in clinical experience concurrent with DMI classroom courses. Clinical responsibilities will be arranged by the Diagnostic Medical Imaging program faculty and will include day, evening, and/or weekend assignments. The student receives no salary for this clinical experience but will receive course credit toward program completion.

Successful DMI program completion requires the following:

1. Completion of all required radiologic technology courses as outlined in the catalog, and
2. Completion of approximately 1,900 clinical hours, and
3. Completion of all requirements for an Associate in Science degree as required by Long Beach City College (Plan Code: 2612), **or** possess an associate degree or higher.

Eligibility for the American Registry of Radiologic Technologists (ARRT) Radiography registry exam and California Department of Public Health - Radiological Health Branch (CDPH-RHB) CRT and Fluoroscopic permit examination are dependent upon meeting these requirements. Successful applicants have the right to use the title "Registered Radiologic Technologist" R.T. (R) CRT.

LBCC College Application Procedures

LBCC College applications to become a student are accepted on a continuous basis.

1. Apply for admission to the college through the Admissions Office (applications are available online at <http://www.lbcc.edu/admissions> (<http://www.lbcc.edu/admissions/>))
2. Submit transcripts from high school and previous college work to the Admissions Office and the School of Health Sciences and Kinesiology.

DMI Program Application Requirements and Placement on the DMI Program Waitlist

Prospective students must apply to the college (see above) and become a registered LBCC College student first.

DMI Program Applications and placement on the DMI Program waitlist are not accepted until the following prerequisites are met:

1. Graduation from an accredited high school, or the equivalent.
2. Cumulative grade point average of 2.5 or higher in **all** college coursework.
3. Completion of AH 60 Medical Terminology, AH 61 Integration of Patient Care, and ANAT 41 Anatomy & Physiology within five years of the DMI application date with a letter grade of "C" or better.
4. Students **must** attend one of the DMI program monthly information sessions prior to application submission.
5. Complete the Diagnostic Medical Imaging program application form (in person only) and bring the completed application form and documentation to the School of Health Sciences and Kinesiology, Room C100 at the Liberal Arts Campus.
6. Students **must** keep the Admissions and Records office **and** the School of Health Sciences and Kinesiology advised of their current email address, home address, and telephone number and any name changes. All changes **must** be submitted in writing.
7. All applicants will be notified by email regarding the status of their applications.

DMI program applications are accepted on a continual basis.

The DMI program typically has a waitlist of applicants. We **highly** suggest that the candidate complete the application requirements and apply to the DMI program first. Placement on the DMI waitlist is based upon application submission date. While the candidate is on the waitlist, we suggest that they complete their associate degree courses and take the ATI TEAS exam.

Information Session

The Diagnostic Medical Imaging program (DMI) holds monthly information sessions from September to June (**except January**). Please look up times, days, and locations of the information sessions on the LBCC website under "explore our programs" then "Health" and then "DMI Program/Radiology." You may also contact the Allied Health Office, DMI program director, Allied Health Coordinator, or the counseling office.

1. Students **must** attend one of the DMI program information sessions before their DMI application is accepted. If a student submits a DMI application prior to attending one of the information sessions, their application submission date will be changed to the date when they attended the DMI information session. Placement on the DMI waitlist is based upon application submission date.
2. Students who need additional information about the DMI program are welcome to attend.

DMI Program Waitlist

Candidates are placed on a waitlist based upon completed application submission date. Applicants who do not attempt the TEAS exam within

one year of the application date will have their applications removed off the waitlist.

ATI TEAS Exam (Test of Essential Academic Skills)

At the time of applying to the DMI program in person at the Allied Health Office (Building C, room 100), applicants will have the opportunity to acquire information on the TEAS Exam, TEAS help, and TEAS examination dates. TEAS exams **must** be scheduled through the Allied Health Office and are offered 4 times per year. The applicant has 3 attempts to pass the TEAS exam with a score of 62% or higher. The cost per exam is about \$60.00. If the applicant does not attempt the TEAS exam within one year of the application date, the applicant's application will be removed. If the candidate wishes to re-enter the waitlist, they would have to re-apply to the DMI program and be placed on the waitlist based on their new application date.

General Information Items

1. A strong command of the English language, both written and verbal, is essential for successful completion of the program.
2. Evidence of physical and emotional fitness by medical examination and personal interview. This is submitted in the summer of the 1st year of the DMI program.
3. A current and clear background check, AHA BLS Provider CPR card, vaccinations, flu shot, TB test, LBCC physical health form, drug test, and malpractice insurance are required also during the summer of the 1st year. (An unclear background may prevent the student from completing clinical requirements and jeopardize ARRT and CDPH certification.)
4. The program is 30 months in length, beginning each spring semester. Each student must complete approximately 1,900 hours of clinical practicum and approximately 1,800 hours of didactic courses. Most courses are conducted Monday through Saturday. Most courses are between 6 AM and 10 PM.

DMI Program Admission Requirements and Selection Process

The following is considered in the selection process during the month of November for the following spring DMI program class:

1. Date of DMI program application.
2. Either completion of the LBCC General Education requirements for an Associate Degree Plan A, B, or C **or** possess an associate degree or higher.
3. **Must** pass within three attempts **and** within 3 years of the DMI application date the ATI TEAS (Test of Essential Academic Skills) exam with a score of 62% or higher. Older TEAS versions are not accepted.
4. Provisionally accepted students **must** attend the **mandatory DMI advisory meeting**, scheduled in December, prior to the DMI program starting in the spring semester in order to progress in the DMI program.^{1, 2}

¹ Due to their service to our country and time away from public life, up to 2 veterans per year are given immediate placement into the next available DMI Program class, upon completion of the following:

1. DMI program application submission
2. Completion of items # 2, 3, and 4 under "DMI Program Admission Requirements and Selection Process"

² The DMI program participates with the Promised Pathways Program for Long Beach Unified High School District. Placement into the DMI promise pathway is awarded based upon specific criteria (Contact DMI program Director for details).

Upon Acceptance to the DMI Program

Every accepted applicant must provide a current criminal background check, complete vaccinations, obtain an AHA Healthcare Provider BLS CPR card, obtain liability insurance, complete a drug test, complete the health evaluation form, be able to perform essential physical functions, and complete a latex allergy form. Additional information regarding this is provided at program acceptance. The background check will include criminal offense, criminal history, sex offender check, and social security trace. (An unclear background may prevent the student from being accepted into one of our affiliated clinical facilities as well as completing clinical requirements.)

Upon Completion of the DMI Program

Upon program completion, the DMI program graduate is eligible to take the American Registry of Radiologic Technologists (ARRT) national certification exam. Through the California Department of Public Health – Radiological Health Branch (CDPH-RHB), California State CRT certification is awarded upon passing the ARRT Radiography exam, applying for the CRT certification, and making payment for the CRT certificate. Once obtaining the CRT certification, graduates are eligible to take the CDPH Fluoroscopy permit exam. When the above is completed, the DMI program graduate will have the right to use the title "Registered Radiologic Technologist" R.T. (R) CRT and may pursue further education through an educational institute or on-the-job training in Ultrasound, Nuclear Medicine, Radiation Therapy, Interventional Radiology, Cardiac Cath Lab, Mammography, MRI, CT, Management, or Radiography education. Information about graduate courses/schools may be obtained at www.arrt.org (<http://www.arrt.org>) or www.asrt.org (<http://www.asrt.org>) or the California Department of Public Health at www.cdph.ca.gov (<http://www.cdph.ca.gov>).

Accreditation and Program Approvals

Long Beach City College is accredited by the Accrediting Commission of Community and Junior Colleges of the Western Association of Schools and Colleges. The Diagnostic Medical Imaging (DMI) program is approved by the American Registry of Radiologic Technologists (ARRT) and the California Department of Public Health – Radiologic Health Branch (CDPH-RHB).

Eligibility for the ARRT Exam

Eligibility for the ARRT examination requires the candidate to complete an ARRT approved Radiology program, possess a minimum of an associate degree, and be of good moral character. Conviction of a misdemeanor or felony may disqualify the candidate. An Ethics pre-application review may be pursued by contacting the ARRT at www.ARRT.org (<http://www.ARRT.org>). There are specific parameters regarding the charge or conviction of a felony or misdemeanor. An applicant may contact the ARRT to determine if he/she will be disqualified due to legal circumstances. The process to determine

eligibility is titled "ETHICS PRE- APPLICATION REVIEW" and the cost is approximately \$100.00.

LBCC Advanced Medical Imaging Programs – CT and MRI

Entry into either the CT (Computed Tomography) or MRI (Magnetic Resonance Imaging) program requires that applicants possess their ARRT credentials in an ARRT Primary Certification (Radiography, Nuclear Medicine, Radiation Therapy, or Ultrasound) and possess an associate degree or higher. ARMRIT certification is not accepted.

Associate in Science Degrees

- Diagnostic Medical Imaging (Radiologic Technology) - Associate in Science (<https://lbcc-public.courseleaf.com/degrees-certificates/diagnostic-medical-imaging/diagnostic-medical-imaging-radiologic-technology/>)

Certificates of Achievement

- Diagnostic Medical Imaging (Radiologic Technology) - Certificate of Achievement (<https://lbcc-public.courseleaf.com/degrees-certificates/diagnostic-medical-imaging/diagnostic-medical-imaging-radiologic-technology-certificate-achievement/>)

Certificates of Accomplishment

- Computed Tomography - Certificate of Accomplishment (<https://lbcc-public.courseleaf.com/degrees-certificates/diagnostic-medical-imaging/computed-tomography-certificate-accomplishment/>)
- Magnetic Resonance Imaging Technologist - Certificate of Accomplishment (<https://lbcc-public.courseleaf.com/degrees-certificates/diagnostic-medical-imaging/magnetic-resonance-imaging-technologist-certificate-accomplishment/>)

DMI 10 3 units

Introduction of Radiologic Technology

54 hours lecture

Prerequisite: AH 60 and AH 61 and ANAT 41.

Grading: letter grade.

This course is a study of the history and basic principles of medical radiography, the mechanics of radiographic exposure, the processing of the latent image, basic electrical and radiation safety measures, and medicolegal issues that relate to the practice of radiologic technology. Transferable to CSU Only

DMI 11 1 units

Radiographic Techniques

18 hours lecture

Prerequisite: DMI 20.

Grading: letter grade.

This course is a study of the criteria required to select x-ray machine settings to produce diagnostic quality radiographs and the compensations in radiographic technique that are required for pathologic conditions.

Transferable to CSU Only

DMI 12 3 units

Contrast Fluoroscope/Radiographic Proced.

54 hours lecture

Corequisite: DMI 11.

Grading: letter grade.

This course is a study of basic Fluoroscopy: Radiographic Contrast Media administration, pharmacology, safety, and treatments. Contrast Media examinations, Special Procedures, Digital Angiography, Vascular and Non-Vascular intervention are also discussed within the scope of this course.

Transferable to CSU Only

DMI 14 3 units

Trends and Self-Assessment in Rad Tech

54 hours lecture

Prerequisite: DMI 15 or current Certified Radiologic Technologist (CRT).

Grading: letter grade.

Comprehensive review of the diagnostic medical imaging core curriculum. Serves as a preparation for state certification and national registry exams.

Transferable to CSU Only

DMI 15 3 units

Computer Applications in Radiology

54 hours lecture

Prerequisite: DMI 24.

Grading: letter grade.

This course is a study of the history of computer systems, hardware and software, and their uses in radiology. Specific areas covered are: CT, Digital Imaging, MRI, and Picture Archiving Systems.

Transferable to CSU Only

DMI 20 3 units

Introduction to Radiologic Physics

54 hours lecture

Prerequisite: DMI 10.

Grading: letter grade.

This course provides a study of the basic principles of physics involved in the production, behavior, modification, and control of radiation.

Transferable to CSU Only

DMI 21 2 units

Applied Radiological Physics

18 hours lecture, 54 hours laboratory

Prerequisite: DMI 20.

Grading: letter grade.

This course is a study of the application of the interaction of radiation and matter, technique manipulation, quality assurance, and quality control. Students are introduced to advanced Medical Imaging including: digital imaging; ultrasound; nuclear medicine; radiation oncology; PET; SPECT; and bone densitometry.

Transferable to CSU Only

DMI 24 3 units

Radiation: Biology and Protection

54 hours lecture

Prerequisite: DMI 21.

Grading: letter grade.

This course presents a history of ionizing radiation exposure to humans. Cellular and biologic effects of ionizing radiation are explored, with specific emphasis as to ways of limiting exposure to patients and personnel. State and Federal regulations are discussed as they pertain to Diagnostic Medical Imaging.

Transferable to CSU Only

DMI 30 3 units**Positioning for General Diagnostic Rad****36 hours lecture, 54 hours laboratory**

Prerequisite: DMI 20.

Recommended Preparation: DMI 11.

Grading: letter grade.

This course is the study of positioning for general and specialized radiologic exams of the skeletal system and adjacent organ systems. The student will develop skill in positioning the patient, film, and x-ray tube, and select appropriate techniques to produce diagnostic quality radiographic images.

Transferable to CSU Only

DMI 31 3 units**Positioning for Cranial Radiography****36 hours lecture, 54 hours laboratory**

Prerequisite: DMI 30.

Grading: letter grade.

This course is the study of positioning for general and specialized radiologic exams of the cranium and its contents. The student will develop skill in positioning the patient, film and x-ray tube, and select appropriate techniques to produce diagnostic quality radiographic images.

Transferable to CSU Only

DMI 40A 2.5 units**Clinical Radiology****144 hours laboratory**

Prerequisite: DMI 10 and DMI 20.

Grading: letter grade.

This course is the clinical application of theoretical knowledge to the practice of radiologic technology, correlation of clinical experiences, training and career goals, interpersonal relations, job oriented problems and image quality control. The course includes an assignment to a radiology department in an accredited hospital for clinical experience.

Transferable to CSU Only

DMI 40B 7.5 units**Clinical Radiology****18 hours lecture, 351 hours laboratory**

Prerequisite: DMI 40A.

Grading: letter grade.

This course is the clinical application of theoretical knowledge to the practice of radiologic technology, correlation of clinical experiences, training and career goals, interpersonal relations, job-oriented problems and image quality control. The course includes an assignment to a radiology department in an accredited hospital for clinical experience.

Transferable to CSU Only

DMI 40C 6 units**Clinical Radiology****18 hours lecture, 270 hours laboratory**

Prerequisite: DMI 40B.

Grading: letter grade.

This course is the clinical application of theoretical knowledge to the practice of radiologic technology, correlation of clinical experiences, training and career goals, interpersonal relations, job-oriented problems and image quality control. The course includes an assignment to a radiology department in an accredited hospital for clinical experience.

Transferable to CSU Only

DMI 40D 10 units**Clinical Radiology****18 hours lecture, 504 hours laboratory**

Prerequisite: DMI 40C.

Grading: letter grade.

This course is the clinical application of theoretical knowledge to the practice of radiologic technology, correlation of clinical experiences, training and career goals, interpersonal relations, job oriented problems and image quality control. The course includes an assignment to a radiology department in an accredited hospital for clinical experience.

Transferable to CSU Only

DMI 40E 10 units**Clinical Radiology****18 hours lecture, 504 hours laboratory**

Prerequisite: DMI 40D.

Grading: letter grade.

This course is the clinical application of theoretical knowledge to the practice of radiologic technology, correlation of clinical experiences, training and career goals, interpersonal relations, job-oriented problems and image quality control. The course includes an assignment to a radiology department in an accredited hospital for clinical experience.

Transferable to CSU Only

DMI 40F 3 units**Clinical Radiology****18 hours lecture, 108 hours laboratory**

Prerequisite: DMI 40D.

Grading: letter grade.

This course is the clinical application of theoretical knowledge to the practice of radiologic technology, correlation of clinical experiences, training and career goals, interpersonal relations, job-oriented problems and image quality control. The course includes an assignment to a radiology department in an accredited hospital for clinical experience.

This course partially fulfills the required hours of clinical experience set forth by the California Department of Public Health, Radiation Health Branch.

Transferable to CSU Only

DMI 60 3 units**Radiologic Pathology****54 hours lecture**

Prerequisite: ANAT 41 and DMI 11.

Grading: letter grade.

This course is an introduction to the study of disease as it relates to radiologic technology. It includes the causes, signs, symptoms and radiographic demonstration of common human diseases. The course acquaints the student with various pathologic conditions and their impact on the radiographic process.

Transferable to CSU Only

DMI 61 2 units**Fluoroscopy****36 hours lecture, 18 hours laboratory**

Prerequisite: DMI 40D or Equivalent.

Corequisite: DMI 14.

Grading: letter grade.

This course includes the principles of radiation protection, fluoroscopy and viewing equipment, recording systems, quality control, patient positioning and regulatory provisions associated with fluoroscopy. This course prepares students to obtain a Department of Health Services Fluoroscopy permit.

Transferable to CSU Only

DMI 222 0.5 units**Venipuncture for Medical Imaging
9 hours lecture, 9 hours laboratory**

Prerequisite: DMI 12 and AH 61.

Grading: letter grade or pass/no pass.

This course is designed for instruction and supervised practice of the concepts and techniques of venipuncture. This course will partially fulfill the requirements of the California Health and Safety Code Section 106985 pertaining to Radiologic Technologists.

DMI 401 3 units**Physical Principles of MRI
54 hours lecture**

Prerequisite: Possession of a valid Certified Radiologic Technologist (CRT) and/or American Registry of Radiologic Technologist (ARRT) license.

Recommended Preparation: DMI 14 and DMI 40E.

Grading: letter grade.

This course provides the student with a comprehensive overview of Magnetic Resonance Imaging (MRI). Included are image acquisition; MRI equipment, terminology, and instrumentation; tissue characteristics; basic patient and personnel safety; patient assessment and preparation; imaging parameters, and quality assurance. The course is designed to allow practicing technologists the opportunity to acquire the necessary skills and knowledge to qualify for national licensure as MRI technologists.

DMI 402 3 units**Magnetic Resonance Imaging Procedure
54 hours lecture**

Prerequisite: Possession of a valid Certified Radiologic Technologist (CRT) and/or American Registry of Radiologic Technologist (ARRT) license.

Grading: letter grade.

This course includes imaging techniques related to the Central Nervous System, neck thorax, musculoskeletal system and abdomen and pelvic regions. Specific clinical application, coils available and their use, consideration in the scan sequences, specific choices of protocols, and positioning criteria will be included. Planes that best demonstrate anatomy and the signal characteristics of normal and abnormal structures are discussed.

DMI 403 3 units**Cross-Sectional Anatomy
54 hours lecture**

Prerequisite: Possession of a valid Certified Radiologic Technologist (CRT) and/or American Registry of Radiologic Technologist (ARRT) license.

Recommended Preparation: ANAT 41.

Grading: letter grade.

This is a study of human anatomy as seen in axial, sagittal, and coronal planes as would be shown on CT or MRI examinations. Bony, muscular, vascular, soft tissues, and organs of the following anatomical regions are studied: central nervous system, head, neck, musculoskeletal, cardiovascular, thorax, abdomen, and pelvis.

DMI 404 3 units**MRI/CT Pathology
54 hours lecture**

Prerequisite: DMI 60 or DMI 403.

Grading: letter grade.

This course familiarizes the student with the common pathologies demonstrated on MRI/CT examinations and their appearance with various imaging protocols. The course content will include all commonly imaged body systems and structures.

DMI 405A 2.5 units**MRI Clinical Practicum
144 hours laboratory**

Prerequisite: Possession of a valid Certified Radiologic Technologist (CRT) and/or American Registry of Radiologic Technologist (ARRT) license.

Grading: letter grade.

Formerly DMI 405AB. This course allows the students the opportunity to practice the skills necessary to obtain high quality MR images, to objectively alter protocols based on patient pathology or physical condition, and to identify image quality problems and make appropriate corrections.

DMI 405B 2.5 units**MRI Clinical Practicum
144 hours laboratory**

Prerequisite: DMI 405A.

Grading: letter grade.

This course allows the students the opportunity to continue to practice the skills necessary to obtain high quality MR images, to objectively alter protocols based on patient pathology or physical condition, and to accumulate the required examinations designated by the American Registry of Radiologic Technologists.

DMI 406 3 units**Computerized Tomography Physics
54 hours lecture**

Prerequisite: Possession of a valid Certified Radiologic Technologist (CRT) and/or American Registry of Radiologic Technologist (ARRT) license.

Grading: letter grade.

This course provides the student with a comprehensive understanding of the physical principles and instrumentation involved in computed tomography (CT). Included are: physics topics, CT systems and operation data acquisition and display, and radiation protection practices. The course is designed to allow practicing technologists the opportunity to acquire the necessary skills and knowledge to qualify for national licensure as CT technologists.

DMI 407 3 units**Computerized Tomography Procedures
54 hours lecture**

Prerequisite: Possession of a valid Certified Radiologic Technologist (CRT) and/or American Registry of Radiologic Technologist (ARRT) license.

Grading: letter grade.

This course provides the student with detailed instruction on imaging techniques for computer tomography (CT). Procedures included are central nervous and musculoskeletal systems, neck, thorax, abdomen and pelvis. Specific clinical application, indications for the procedure, patient education, assessment and preparation, positioning, contrast media usage, and image processing will be included. CT images will be reviewed for quality, anatomy and pathology.

DMI 462 3.5 units

Mammography

54 hours lecture, 27 hours laboratory

Prerequisite: DMI 40D or equivalent.

Grading: letter grade.

This course prepares students to obtain the Department of Health Services Mammography license. It includes principles of components of dedicated mammography equipment, radiation protection legislation, quality assurance regulations and mammographic positioning.