

Medical Imaging

Biological and Health Sciences Division, Room B213,
(847) 543-2042

Medical Imaging (Associate in Applied Science) Plan 21MI

This is a limited enrollment program. MIM courses are predominantly offered during the day with the exception of MIM 110. Students are required to meet the screening requirements in effect at the time of screening. Students who screen and are accepted into a limited enrollment program will be required to complete the curriculum that is in place at the time of entrance into the program. If students who screen are not granted admission, they must rescreen and satisfy all screening and curriculum requirements in place for a future program start.

Screening Deadline: First Wednesday in March

The Medical Imaging Program prepares radiographers to work in medical facilities producing radiographic examinations which are interpreted by a radiologist or another medical specialist. Graduates of the program are qualified to take the national certification examination given by the American Registry of Radiologic Technologists. Graduates also meet the additional criteria required for Illinois licensure. The Medical Imaging program is nationally accredited by the Joint Review Committee on Education in Radiologic Technology: 20 North Wacker Drive, Suite 2850 Chicago, IL 60606-3182, (312) 704-5300, mail@jrcert.org.

Consistent with the Mission and goals of the College of Lake County, the Medical Imaging Program strives for excellence in preparing students for entry-level positions in the Medical Imaging profession. By maintaining high academic and clinical standards, graduates receive an Associate in Applied Science degree in Medical Imaging, become eligible for certification as Registered Radiologic Technologists, and attain clinical competency as entry-level professional radiographers.

Interested students may take MIM110 prior to being admitted to the program; however, the number of students that can be admitted to the MIM Program is limited. Therefore, a screening procedure is used to select the academically best qualified from those who request consideration. Preference is given to residents of CLC's

district, or a community college district which does not offer a Medical Imaging program and is a member of the CAREER consortium. Students who live outside of CLC's district but are eligible for in-district tuition because they are employed by a district employer are NOT considered residents of the district for purposes of selection into the program.

Students enrolled in the program are required to undergo a background check and a urine drug screen prior to attending their clinical site (MIM 170). The results of the background check and drug screen may result in the student losing his/her seat in the program. The costs are borne by the student.

Students who are selected for the program are required to attend a mandatory orientation session. Failure to attend the mandatory orientation session may result in the student losing his/her seat in the program and the next qualified student on the list will be selected in his/her place.

To be considered for admission to the Medical Imaging Program, students must complete the following screening requirements prior to the screening deadline.

Students must have submitted the following documents to the Welcome and One-Stop Center:

- A. Student Information Form.
- B. **Official** high school transcript with graduation date OR **Official** GED test scores
OR
Official college transcripts with graduation date and degree awarded
OR
Official foreign high school or college transcript evaluated by a NACES approved agency
- C. Medical Imaging Program Request for Screening Form
- D. If using courses from another college to meet prerequisites or degree requirements, submit an official transcript and a "Request for Evaluation of Prior College Transcripts" form to the Office of Registrar and Records.

Associate in Applied Science and Career Certificates

Minimum Selection Criteria: student records must indicate the following:

- A. High school graduate or equivalent or high school senior in last term
- B. College Reading and Writing Readiness and Basic Algebra Readiness
- C. CLC Cumulative GPA is 2.0 or above
- D. High school chemistry or physics with a lab (1 year, C or better)
OR
CHM 120 or CHM 121 or PHY 121 or an equivalent course (C or better)
- E. BIO 123 or BIO 161 or an equivalent course (C or better) ..
- F. High school algebra (2-years, C or better)
OR
MTH 108 or an equivalent course (C or better)
OR
CLC Math Placement Test (indicating proficiency in MTH 108)
- G. Applicants may take the NLN PAX exam once every 90 days (approximately three months). NLN PAX exam results that are less than 90 days between exams will not be considered. Scores used for screening into limited enrollment programs will be valid for only 3 years prior to a screening deadline. Scores older than 3 years will not be considered for screening. Visit www.nlnonlinetesting.org for available test dates and times.
- H. Must be eighteen (18) years of age by mid-term of the fall semester following the screening deadline
- I. Attendance at a Medical Imaging Program Information Session (within two years of the screening deadline)

Students must earn a minimum grade of “C” in each Imaging course to continue in and graduate from the program.

Summer Session One	4
BIO 244 Anatomy and Physiology I	4
Fall Semester One	16
BIO 245 Anatomy and Physiology II.....	4
MIM 110 Introduction to Medical Imaging	3
MIM 111 Radiographic Anatomy and Positioning I	5
MIM 112 Principles of Radiographic Exposure	3
MIM 170 Introduction to the Clinical Education Center.....	1
Spring Semester One	14
ENG 121 English Composition I.....	3
MIM 113 Radiographic Anatomy and Positioning II	5
MIM 114 Clinical Practice I	3
PSY 121 Introduction to Psychology	3
Summer Session Two	4
MIM 115 Clinical Practice II	3
MIM 116 Advanced Radiographic Procedures I	1
Fall Semester Two.....	14
MIM 210 Technical Aspects of Patient Care	2
MIM 211 Imaging Equipment	6
MIM 212 Clinical Practice III	3
CMM 121 Fundamentals of Speech <i>or</i>	
CMM 123 Dynamics of Small Group Discussion <i>or</i>	
CMM 128 Interviewing Practices	3
Spring Semester Two	17
MIM 214 Advanced Topics in Radiography	6
MIM 215 Clinical Practice IV	3
MIM 216 Computer Imaging	2
CMM 127 Intercultural Communication.....	3
HUM 127 Critical Thinking	3
Summer Session Three	3
MIM 271 Clinical Practice V.....	3
Total Hours for A.A.S. Degree	72

Pregnancy Policy

During the first semester in the medical imaging program, all students will be taught basic radiation protection procedures. These instructions will include enough background so that students will be able to understand the possible biological risks of ionizing radiation to the embryo and fetus. In addition, any perspective student attending a Medical Imaging information session receives the NRC guide #8.29 and #8.13 with a brief overview.

Information is available through the United States Nuclear Regulatory Commission (NRC) guide #8.13 on instruction concerning prenatal radiation exposure. The NRC guide and forms are available in the appendices of the MIM handbook or at <http://pbadupws.nrc.gov/docs/ML0037/ML003739505.pdf>

A student may voluntarily inform the department chair and the radiation safety officer in writing using the form in the back of guide #8.13 should a pregnancy occur during the educational period. The pregnancy then becomes declared and a fetal dosimeter will be issued to the student to monitor radiation exposure. The signed NRC 8.13 form letter for declaring pregnancy will be placed in the student's CLC file. A student may rescind pregnancy declaration at any time in writing to the department chair.

Once the student declares their pregnancy, the possible risks to the embryo and fetus shall be reviewed and the review documented and signed by the radiation safety officer and the student. The student will then be referred to the department chair for discussion and documentation of the student's pregnancy options.

The student will choose one of the following pregnancy options:

1. The student may continue in the program without modification. In this case, two dosimeters will be used, one worn at the collar and on top of the apron during fluoroscopy and one worn on the belt and under the apron during fluoroscopy to record the student exposure and the fetal exposure respectively. Should recorded fetal exposure increase to 500 mrem or be received at a rate greater than 50 mrem per month at any time during pregnancy, the student will be required to take a leave of absence [see (b) below]. All course objectives and rotations shall be equivalent to any and all students enrolled in those particular courses. Adherence to radiation protection policies should eliminate almost all fetal exposure. Other counseling on radiation protection procedures shall be done as needed.
2. A leave of absence may be taken until the birth of the child. All medical imaging grades will be recorded as withdrawn (W) if the student grades are acceptable at the time. This will permit the student to return with no penalty. Student acceptance to clinical facilities depends upon availability of sites.
3. The student may terminate the program. All medical imaging grades will be recorded as withdrawn (W) if the student grades are acceptable at the time.

For more information on recommended courses or program specific advising, contact the following faculty members or the Biological and Health Sciences division at (847) 543-2042:

Joe Dielman / Lynn Wiechert

Medical Imaging Technical Performance Standards

Medical Imaging is a practice of discipline with cognitive, sensory, affective, and psychomotor performance requirements. Based on those requirements and [the State of Illinois licensing requirements], a list of “Performance Standards” has been developed. Each standard has an example of an activity or activities that a potential student will be required to perform while enrolled in the radiography program. Please note that these examples are not all inclusive.

Issue	Standard	Examples of Required Activities (Not all inclusive)
Visual	Visual ability sufficient for observation and assessment necessary in the operation of equipment and care of patients.	<ul style="list-style-type: none"> • Visualize x-ray collimator centering light and identify its center. • Observe the patient in order to assess the patient’s condition and/or needs from a distance of at least 20 feet. • Can see numbers, letters, calibrations, etc., of varying sizes located on equipment utilized by a radiographer.
Hearing	Auditory abilities sufficient to monitor and assess patient needs, and to provide a safe environment.	<ul style="list-style-type: none"> • Hear a patient talk in a normal tone from a distance of 20 feet • Hear monitor alarm, emergency signals, and cries for help.
Tactile	Tactile ability sufficient for patient assessment and operation of equipment and care of patients.	<ul style="list-style-type: none"> • Perform palpation, tactile assessment and manipulation of body parts to ensure proper body placement and alignment. • Manipulate dials, buttons and switches of various sizes.
Mental	Mental ability sufficient for patient assessment and operation of equipment and care of patients.	<ul style="list-style-type: none"> • Be able to visually concentrate and focus attention, thoughts, and efforts on patients and equipment for varying periods of time. • Be able to respond to patients’ changing physical conditions.
Environmental Requirements	Physical health sufficient enough to be able to tolerate certain conditions present in the clinical setting.	<ul style="list-style-type: none"> • Be able to tolerate risks of discomforts in the clinical setting that require special safety precautions, additional safety education, and health risk monitoring (i.e., ionizing radiation), working with sharps, chemicals, and infectious disease. Students may be required to use protective clothing or gear such as masks, goggles, gloves, and lead aprons.
Communication	Communication abilities sufficient for interaction with others in verbal and written form.	<ul style="list-style-type: none"> • Effectively communicate to the patient in order to converse, instruct the patient, relieve anxiety, gain their cooperation during procedures, understand the patient when they are communicating symptoms of medical emergency.

Associate in Applied Science and Career Certificates

Issue	Standard	Examples of Required Activities (Not all inclusive)
Mobility	Physical abilities sufficient to move from room to room and maneuver in small spaces.	<ul style="list-style-type: none"> • Assist all patients, according to individual needs and abilities, in moving, turning, transferring from transportation devices to x-ray table, etc. • Be able to push, pull, and lift a minimum 50 lbs. • Push a stretcher and/or wheelchair without injury to self, patient, and others. • Push a mobile x-ray machines from one location to another, including turning corners, getting on and off an elevator, and manipulating it in a patient's room or surgery.
Motor Skills	Gross and fine motor abilities sufficient to provide safe effective patient care.	<ul style="list-style-type: none"> • Manually move the x-ray tube and position the tube at various angles and heights up to 7 feet. • Accurately draw up sterile contrast media and other solutions without contaminating the syringe and/or needles, etc. • Physically be able to administer emergency care including performing CPR. • Place cassettes (image receptors) in Bucky trays and properly manipulate all locks. • Be able to stand for periods as long as 2-hours wearing lead aprons and to walk a distance of 5 miles during a normal work day.
Critical Thinking	Critical thinking ability sufficient for safe, clinical judgment.	<ul style="list-style-type: none"> • Identify cause-effect relationships in clinical situations. • Evaluate radiographs to ascertain that they contain proper identification and are of diagnostic value. • Select exposure factors and accessory devices for all radiographic procedures with consideration of patient size, age, and extent of disease. • Assess patient's condition and needs from a distance of at least 20 feet. • Initiate proper emergency care protocols, including CPR, based on assessment data.
Interpersonal Behavioral and Social Skills	Interpersonal abilities sufficient to interact with individuals, families, and groups from a variety of social, emotional, cultural, and intellectual backgrounds.	<ul style="list-style-type: none"> • Establish rapport with patients, families, and colleagues. • Allow mature, sensitive, and effective relationships with patients and fellow workers (interpersonal skills). • Tolerate physically taxing workload. • Function effectively under stress. • Adapt to changing environments (flexible schedules, emergency conditions). • Display compassion, professionalism, empathy, integrity, concern for others, and interest and motivation.

Developed by St. Petersburg College Radiography Program: Permission granted to CLC.

The American with Disabilities Act of 1990 and Section 504 of the Rehabilitation Act of 1973 and College of Lake County policy prohibits discrimination against individuals with disabilities. One of the purposes of this document is to ensure that students are aware of the requirements of this program and acknowledge their understanding of the program requirements. Students who have a disability and are in need of accommodations or modifications must contact the Office for Students with Disabilities ("OSD"). The OSD will determine whether or not any reasonable accommodations or modifications can be provided.

Associate in Applied Science and Career Certificates

The Medical Imaging program sets forth the following goals and outcomes:

- Goal 1: Students/graduates will use critical thinking and problem-solving skills.
- Students will demonstrate critical thinking skills.
 - Students will have the ability to modify routine procedures.
- Goal 2: Students/graduates will be clinically competent.
- Students will evaluate radiographs for pathological processes.
 - Students will demonstrate proficiency in the surgical suite.
- Goal 3: Students/graduates will be able to communicate.
- Students will communicate effectively during fluoroscopy examinations.
- Goal 4: Student/graduates will evaluate the importance of professional growth and development.
- Students will assess their growth and development.
 - Students will demonstrate a basic understanding of advanced imaging modalities.
- Goal 5: Program effectiveness measures.
- Students/graduates will pass the certification examination.
 - Graduates will have the knowledge and skills expected by employers as entry technologists.
 - Graduates will obtain employment in radiography.
 - Graduates will complete the program within two years.
 - Graduates will indicate overall satisfaction.

Magnetic Resonance Imaging (MRI) and Computed Tomography (CT) Requirements

These are limited enrollment programs. Didactic courses are only offered online. Students are required to meet the screening requirements in effect at the time of screening. Students who screen and are accepted into a limited enrollment program will be required to complete the curriculum that is in place at the time of entrance into the program. If students who screen are not granted admission, they must rescreen and satisfy all screening and curriculum requirements in place for a future program start.

Consistent with the Mission and Goals of the College of Lake County, the Magnetic Resonance Imaging and the Computed Tomography certificates strive for excellence in preparing students for advanced-level positions in the Medical Imaging profession. By maintaining high academic and clinical standards, graduates receive a certificate in MRI or CT, become eligible for certification as MRI or CT Registered Technologists, and attain clinical competency as advanced professional radiographers.

1. Students must have submitted the following documents to the Welcome and One-Stop Center:

- A. Student Information Form.
- B. **Official** transcripts with graduation date and degree awarded of your related imaging field
- C. **MRI or CT Request for Screening Form**
- D. Copy of current certification of your imaging field
- E. A professional resume documenting years of experience in a related imaging field (must include employer, job responsibilities, and dates employed)
- F. **Official** copy of your certification scores sent directly to CLC from the certifying agency

2. Meet minimum technical performance standards as defined for the profession.

- Please note that MRI is an advanced certificate and open only to students who are registered in radiography or radiation therapy by the ARRT or in nuclear medicine technology by ARRT or the Nuclear Medicine Technology Certification Board (NMTCB) or in sonography by ARRT or in any sonography-related modality by ARDMS. In addition, students must maintain registration in radiography or radiation therapy by the ARRT or in nuclear medicine technology by the ARRT or NMTCB or in sonography by ARRT or in any sonography-related modality by ARDMS at all times to be eligible for certification and registration in magnetic resonance imaging.
- Please note that CT is an advanced certificate and open only to students who are registered in radiography or radiation therapy. In addition, students must maintain registration in radiography or radiation therapy by the ARRT at all times to be eligible for certification and registration in Computed Tomography.

Screening Deadlines

- **MRI** – The deadline is the first Wednesday in March of odd years. If space is available in the program after the initial screening deadline, qualified students will be accepted in an order based on academic qualifications. All required materials must be submitted to the Records Office by the screening deadlines.
- **CT** – The deadline is the first Wednesday in March of even years. If space is available in the program after the initial screening deadline, qualified students will be accepted in an order based on academic qualifications. All required materials must be submitted to the Records Office by the screening deadlines

The number of students that can be admitted to any clinical education course is limited for any given session. Therefore, a screening procedure is used to select the academically best qualified from those who request consideration.

- Preference is given to residents of CLC’s district, or a community college district which does not offer a Medical Imaging program and is a member of the CAREER consortium. Students who live outside of CLC’s district but are eligible for in-district tuition because they are employed by a district employer are NOT considered residents of the district for purposes of selection into the program.
- Students who are selected for the program are required to undergo a background check and a urine drug screen. The results of the background check and drug screen may result in the student losing his/her seat in the program. The costs are borne by the student.
- Students must maintain a minimum grade of “C” in each Medical Imaging course to continue in and graduate from the MRI or CT program. In addition, students must maintain a CLC GPA of 2.0 or higher.

For more information on recommended courses or program specific advising, contact faculty member Lynn Wiechert or the Biological and Health Sciences division at (847) 543-2042.

**Magnetic Resonance Imaging
(Certificate) Plan 21MR**

The Magnetic Resonance Imaging (MRI) certificate prepares radiographers to work in medical facilities as MRI technologists. Graduates of the program are qualified to take the national MRI certification examination given by the American Registry of Radiologic Technologists. See previous page for admission requirements.

Note: The lecture portion of the courses is taught online

Fall Semester (odd years)	8
MIM 251 MRI Physics and Instrumentation	3
MIM 253 MRI Procedures	2
MIM 272 MRI Practicum+	3

Spring Semester	7
MIM 255 MRI Sectional Anatomy and Pathology	4
MIM 272 MRI Practicum+	3

Total Hours for Certificate15

+ The Practicum has been designed to be flexible and accommodate a variety of schedules. Actual clinic days and hours will be determined by the student and the instructor.

**Computed Tomography
(Certificate) Plan 21MT**

The Computed Tomography (CT) certificate prepares radiographers to work in medical facilities as a CT Technologist. Graduates of the program are qualified to take the national CT certification examination given by the American Registry of Radiologic Technologists (ARRT). See previous page for admission requirements.

Note: The lecture portion of the courses is taught online

Fall Semester (even years)	8
MIM 252 CT Physics, Instrumentation, and Procedures I	3
MIM 256 CT Sectional Anatomy and Pathology I	3
++ MIM 273 CT Practicum I+	2

Spring Semester	8
MIM 254 CT Physics, Instrumentation, and Procedures II	3
MIM 258 CT Sectional Anatomy and Pathology II	3
MIM 274 CT Practicum II+	2

Total Hours for Certificate16

Gainful Employment Information: www.clcillinois.edu/gemim

+ The Practicum has been designed to be flexible and accommodate a variety of schedules. Actual clinic days and hours will be determined by the student and the instructor.