

Area of Interest: Health Sciences

## Medical Radiation Technology

Ontario College Advanced Diploma

Program Code: 1615X01FWO

3 Years

Ottawa Campus

### Our Program

**Providing insight into the human body: using diagnostic procedures, build your career as a member of a healthcare team.**

This three-year Ontario College Advanced Diploma program, accredited by the Accreditation Canada Accreditation Canada EQUAL . The program prepares you with the knowledge and technical skills required to produce diagnostic images and carry out diagnostic procedures in the role of a Medical Radiation Technologist. These skills are outlined by the Canadian Association of Medical Radiation Technologists Radiological Technology competency profile. Working independently, and in collaboration with healthcare team members, Medical Radiation Technologists analyze a variety of complex diagnostic images to assist physicians in the diagnosis and management of multiple system disorders.

Through theory, simulations, practice and extensive clinical experiences, you acquire the ability to produce quality images of internal structures of the human body. You also apply health, safety and quality assurance principles while performing venipunctures, interacting with patients, and using ionizing radiation in labs and clinical settings.

Weekly lab sessions with hands-on guidance from faculty prepare you for three practicums totaling more than 1,500 hours in clinical settings either within Ottawa or requiring relocation to another clinical setting across Ontario. These acquired skills help you to function as a member of a healthcare team.

Upon successful completion of the program, graduates are eligible to write the national certification exam. You must pass the Canadian Association of Medical Radiation Technologists (CAMRT) national certification exam to be eligible to register with the College of Medical and Imaging Technologists of Ontario, which is a requirement to work in Ontario.

You may find employment in:

- community and teaching hospitals
- medical clinics
- education and research settings
- private industry

### SUCCESS FACTORS

This program is well-suited for students who:

- Possess excellent communication and interpersonal skills.
- Can be self-directed in a team environment.
- Possess applied technical aptitudes.
- Have strong analytical skills.
- Are detail-oriented.

- Want to work in a variety of challenging work settings.
- Are able to work effectively under stressful situations.

## Employment

Graduates may find employment in community and teaching hospitals, medical clinics, education and research settings and in private industry. Upon successful completion of the Canadian Association of Medical Radiation Technologists (CAMRT) national certification exam, graduates must register with the College of Medical and Imaging Technologists of Ontario (CMRITO) to be eligible for employment in Ontario.

## Learning Outcomes

The graduate has reliably demonstrated the ability to:

1. Produce and assess a variety of high-quality diagnostic images employing current technologies for image acquisition and processing.
2. Interpret requests and adapt procedures relative to patient and diagnostic image requirements in routine and complex clinical cases.
3. Comply with relevant legislation, regulations and ethical standards for the best practice in diagnostic imaging.
4. Employ accepted radiation, health and safety practices with self, patients, their families, and healthcare team members in a variety of clinical settings.
5. Provide quality care to diverse patients in assessment, diagnostic imaging, and therapeutic intervention, while incorporating patient advocacy and education to patients, their family, healthcare team members and the public.
6. Monitor patients' status at all times and respond to emergency situations where indicated.
7. Operate, calibrate, set up, troubleshoot and evaluate a variety of complex equipment safely.
8. Analyze a broad range of diagnostic imaging procedures to assist physicians in the diagnosis and management of multiple system disorders.
9. Interact with patients, their families, the healthcare team members and the public using effective communication and interpersonal skills.
10. Exhibit behaviour consistent with the professional role of a medical radiation technologist, including teamwork, provision of health education and establishment of strategies for lifelong learning.
11. Identify and apply discipline-specific practices that contribute to the local and global community through social responsibility, economic commitment and environmental stewardship.

## Program of Study

Level: 01	Courses	Hours
BIO0002	Applied Anatomy and Physiology I	42.0
ENL1813S	Communications I	42.0
IMG0102	Radiological Protocols I	84.0
IMG0103	Radiological Protocols Laboratory I	42.0
IMG0128	Quality Control for General Radiography	28.0

IMG0140	Professional Practice Foundations for Imaging Technologist	28.0
IMG0141	Introduction to Radiological Imaging Principles	42.0
IMG0149	Medical Radiation Physics	42.0
<b>Level: 02</b>	<b>Courses</b>	<b>Hours</b>
BIO0003	Applied Anatomy and Physiology II	42.0
IMG0110	Radiological Protocols Laboratory II	42.0
IMG0118	Radiation Biology and Protection	28.0
IMG0122	Pathology I	28.0
IMG0133	Applied Radiological Protocols	70.0
IMG0134	Computed Tomography-Physical Principles	28.0
IMG0139	Imaging and Quality Control Laboratory	28.0
IMG0146	Imaging Systems, Acquisition, and Data Management	42.0
IMG1038	Patient Management for Medical Imaging Professionals	14.0
IMG1039	Patient Management Skills for Medical Imaging Professionals	14.0
<b>Choose one from equivalencies:</b>	<b>Courses</b>	<b>Hours</b>
GED1615	General Education Elective	42.0
<b>Level: 03</b>	<b>Courses</b>	<b>Hours</b>
BIO0004	Applied Anatomy and Physiology III	42.0
ENL0064	Professional Communication Skills for Medical Radiation Technologists	42.0
IMG0116	Radiological Protocols Laboratory III	42.0
IMG0117	Pathology II	28.0
IMG0132	Contrast Media Agents and Intravenous Injection Skills	14.0
IMG0142	Computed Tomography-Imaging Procedures and Protocols	56.0
IMG0143	Transition to Clinical Practice	28.0
IMG0144	Adaptive Imaging Principles	42.0
IMG0145	Advanced Radiological Procedures and Protocols	28.0
IMG0147	Advanced Patient Management for MRTs	28.0
IMG0148	Introduction to Health Research	28.0
IMG1035	Professional Practice and Legislation for Medical Imaging Professionals	28.0
<b>Level: 04</b>	<b>Courses</b>	<b>Hours</b>
IMG0119	Clinical Practicum 1	600.0
<b>Choose one from equivalencies:</b>	<b>Courses</b>	<b>Hours</b>

GED1615	General Education Elective	42.0
<b>Level: 05</b>	<b>Courses</b>	<b>Hours</b>
IMG0120	Clinical Practicum 2	600.0
<b>Choose one from equivalencies:</b>	<b>Courses</b>	<b>Hours</b>
GED1615	General Education Elective	42.0
<b>Level: 06</b>	<b>Courses</b>	<b>Hours</b>
IMG0121	Clinical Practicum 3	525.0
IMG1041	Comprehensive Review for Certification Exam	66.0

## Fees for the 2023/2024 Academic Year

Tuition and related ancillary fees for this program can be viewed by using the Tuition and Fees Estimator tool at <https://www.algonquincollege.com/fee-estimator>.

Further information on fees can be found by visiting the Registrar's Office website at <https://www.algonquincollege.com/ro>.

Fees are subject to change.

Additional program related expenses include:

- Prior to placement, Clinical Practicums require training in Health and Safety, WHMIS, OWHSA training and approved Non-Violent Crisis Intervention (NVCi) training. There are some additional costs associated with training that should be anticipated by students which are not covered by tuition fees.
- Printed books required for the program are approximately \$1,200.
- The uniform costs required for clinical/lab activities (all three years) are approximately \$300.
- Please note that travel and parking expenses, to partnering clinical sites for observation and clinical experiences throughout the program, are the responsibility of the student.
- In addition, students are required to finance clinical experience related expenses, such as travel and housing accommodations for all activities in the program.
- In order to be eligible for employment in Ontario, students must register with the College of Medical and Imaging Technologists of Ontario (CMRITO) with a preregistration fee of \$105 (subject to change).
- The Canadian Association of Medical Radiation Technologists (CAMRT) national certification exam fee is \$907 with an additional test centre fee of \$150.41 plus tax. All fees are based on 2023 costs and are subject to change.

## Admission Requirements for the 2024/2025 Academic Year

### College Eligibility

- Ontario Secondary School Diploma (OSSD) or equivalent. Applicants with an OSSD showing senior English and/or Mathematics courses at the Basic Level, or with Workplace or Open courses, will be tested to determine their eligibility for admission; OR
- General Educational Development (GED) certificate; OR
- Mature Student status (19 years of age or older and without a high school diploma at the start of the program). Eligibility may be determined by academic achievement testing for which a fee of \$50 (subject to change) will be charged.

**Program Eligibility**

- English, Grade 12 (ENG4C or equivalent) with a grade of 65% or higher
- Mathematics, Grade 12 (MAP4C or equivalent) with a grade of 65% or higher
- Physics, Grade 11 or 12 with a grade of 65% or higher; AND
- Biology, Grade 11 or 12 with a grade of 65% or higher; OR
- Chemistry, Grade 11 or 12 with a grade of 65% or higher
- All applicants must complete an assessment of their knowledge and skills through the Test Centre, and pay an exam fee. Results from the Algonquin College Health Program Admissions Test (AC-HPAT) will be utilized to establish minimum eligibility and applicant ranking. The AC-HPAT can only be written once per academic cycle. For further information on the HPAT and how to book your assessment, please visit Algonquin's Test Centre.
- Applicants with international transcripts must provide proof of the subject-specific requirements noted above and may be required to provide proof of language proficiency. Domestic applicants with international transcripts must be evaluated through the International Credential Assessment Service of Canada (ICAS) or World Education Services (WES).
- IELTS-International English Language Testing Service (Academic) Overall band of 6.5 with a minimum of 6.0 in each band; OR TOEFL-Internet-based (iBT)-overall 88, with a minimum of 22 in each component: Reading 22; Listening 22; Speaking 22; Writing 22; OR Duolingo English Test (DET) Overall 120, minimum of 120 in Literacy and no score below 105.

Not sure if you meet all of the requirements? Academic Upgrading may be able to help with that: <https://www.algonquincollege.com/access/> .

**International Applicants:**

International applicants who meet the program eligibility requirements are required to complete preparatory courses (4-months in duration): Introduction to Canadian Health Studies (ICHS). Students who successfully complete the introduction will then proceed to their original health program of choice. The ICHS requires applicants to submit an academic IELTS score.

Please click this link for more information:

<https://www.algonquincollege.com/healthandcommunity/ICHS/> .

**ACCEPTED APPLICANTS MUST:****Police Records Check Documentation:**

Applicants must note important information listed below regarding Police Record Check program requirements.

It is your responsibility to obtain the Police Records Check For Service With Vulnerable Sector (PRCSVS) from your local Police Department prior to the deadline identified by your program and to pay any associated costs. It may take a long time to obtain this documentation; please submit your application as early as possible. Should you require further information, contact the Program Chair.

**Lab and Clinical Placement Eligibility:****Lab Requirements:**

Proof of a clear (PRCSVS)- annual requirement. You may be required to disclose the contents of the PRCSVS, including all notations, to the placement agencies.

**Clinical Placement Requirements:**

Successful completion of clinical placement is a requirement for graduation from the Medical Radiation Technology program. To be eligible to participate in clinical placement activities, you must complete ParaMed requirements and submit:

- Proof of a clear (PRCSVS)- annual requirement. You may be required to disclose the contents of the PRCSVS, including all notations, to the placement agencies.
- Evidence of a current Cardio-Pulmonary Resuscitation Training C.P.R. Basic Rescuer `C` Level certification and Standard First Aid certification.

- Evidence of mask fit-tested for N-95 equivalent masks required for infection-control measures as required by the Ministry of Health and Long-Term Care Guidelines.
- A Health Assessment Form and provide an Immunization Certificate. Applicants must have complete immunization including Hepatitis B, and annual T.B. test (a Chest X-ray is required if the T.B. test is positive) and are required to have annual immunization for influenza by some clinical affiliates.
- All ParaMed Clinical/Field Pre-Placement Health requirements one (1) month prior to starting clinical placements. Applicants must have complete immunization including Hepatitis B, and annual T.B. test (a Chest X-ray is required if the T.B. test is positive) and are required to have annual immunization for influenza by some clinical affiliates. Additional details regarding the requirements including immunizations, may be found in the form mentioned above under the Accepted Applicant tab-Placement Forms.
- Evidence of Workplace Hazardous Materials Information System (WHMIS) and Ontario Health and Safety Awareness (OHSA) Training certification. These courses meet program requirements are free to registered students and can be accessed through the Algonquin College website:  
<https://www.algonquincollege.com/safety-security-services/home/occupational-%20health-and-safety/health-safety-training-resources/> .
- Proof of current Non-Violent Crisis Intervention (NVCI) training-Some clinical affiliates require a yearly proof of NVCI training.

## **Admission Requirements for 2023/2024 Academic Year**

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- Academic and Career Entrance (ACE) certificate; OR
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<https://www.algonquincollege.com/safety-security-services/home/occupational-health-and-safety/health-safety-training-resources/> .
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**Application Information**

**MEDICAL RADIATION TECHNOLOGY****Program Code 1615X01FWO**

Applications to full-time day programs must be submitted with official transcripts showing completion of the academic admission requirements through:

ontariocolleges.ca  
60 Corporate Court  
Guelph, Ontario N1G 5J3  
1-888-892-2228

Students currently enrolled in an Ontario secondary school should notify their Guidance Office prior to their online application at <http://www.ontariocolleges.ca/>.

Applications for Fall Term and Winter Term admission received by February 1 will be given equal consideration. Applications received after February 1 will be processed on a first-come, first-served basis as long as places are available.

International applicants please visit this link for application process information:  
<https://algonquincollege.force.com/myACint/>.

For further information on the admissions process, contact:

Registrar's Office  
Algonquin College  
1385 Woodroffe Ave  
Ottawa, ON K2G 1V8  
Telephone: 613-727-0002  
Toll-free: 1-800-565-4723  
TTY: 613-727-7766  
Fax: 613-727-7632  
Contact: <https://www.algonquincollege.com/ro>

**Additional Information**

The College of Medical and Imaging Technologists of Ontario has a number of requirements for registration that relate to the past and present conduct of the applicant, as well as mental and physical health conditions. To find out if you would be eligible to practise in Ontario, please access the website: <https://www.cmrito.org/applicants/registration-requirements/>.

Students are required to participate in clinical/lab simulations including invasive procedures such as venipuncture both as a patient and technologists roles.

**Clinical Placement:**

Some clinical placements are outside of Ottawa. Students are responsible for their own travel and accommodation.

If at any time during the program there is a break in the student's progress of one term or more, the student is required to enroll and pass a mandatory Continuing Education course to update practicum skills. The student is responsible for the cost of the required Continuing Education course and must advise the Program Coordinator of their intentions to return to the program six weeks in advance of the start of the semester in which they would like to return. Returning status will be granted based on the availability of placement sites.

During clinical practicum placement, if there are significant professional/safety infractions, students will be removed from the clinical site and pending the results of an investigation may receive an F grade for the clinical placement course.

**Timetable:**

Timetable for the program includes days, evenings and weekends.

**Contact Information****Program Coordinator(s)**

- Sylvie Ferguson, <mailto:ferguss@algonquincollege.com>, 613-727-4723, ext. 3568



## Course Descriptions

### **BIO0002 Applied Anatomy and Physiology I**

The study of the human body as outlined by anatomy and physiology concepts is the basic knowledge for positional techniques of patients. All tissue types are explored and analyzed. Students perform problem solving related to the maintenance of homeostasis. Students study the appendicular skeleton in precise detail in order to identify all anatomy on radiographic images. The respiratory system is investigated in depth utilizing multi-sectional concepts. Through instruction and exploration of anatomical models for both the skeletal and respiratory systems, students discover anatomy in detail to correlate it to a radiographic image.

Prerequisite(s): none

Corerequisite(s):none

### **BIO0003 Applied Anatomy and Physiology II**

Understanding of anatomical and physiological variances in diverse patient populations is essential to enable the medical radiation technologist to adapt the positioning requirements. Students integrate the anatomy of the axial skeleton and soft tissue structures. Anatomical development with emphasis placed on osseous tissue is studied in neonate, pediatric and adult patients. The anatomy and physiology of the digestive and urinary systems are explored and related to radiographic imaging in multi-sectional format. Through discovery of anatomical structures using models, diagrams and images of the axial skeleton, digestive and urinary systems, students continue to identify anatomy and translate this to radiographic images.

Prerequisite(s): BIO0002

Corerequisite(s):none

### **BIO0004 Applied Anatomy and Physiology III**

The understanding of multi-sectional relationship in the human anatomy is an essential skill used to adapt imaging protocols. Students study detailed anatomy of the cranium in relationship to radiographic requirements. The anatomy and physiology of the cardiovascular, nervous, lymphatic and reproductive systems are described. Students evaluate the relational anatomy of soft tissues and skeletal structures for multi-system cross-sectional imaging. Through continual study of all anatomy, with emphasis on nervous and cardiovascular systems, cross sectional images are examined.

Prerequisite(s): BIO0003

Corerequisite(s):none

### **ENL0064 Professional Communication Skills for Medical Radiation Technologists**

Professional communication skills are essential for Medical Radiation Technologists. Students learn about written and spoken communication principles relevant to various healthcare related settings. Applying different communication strategies to various role-play and in-class activities, students identify communication patterns in self and others. They analyze these patterns objectively and develop strategies to improve their own communication skills.

Prerequisite(s): ENL1813S

Corerequisite(s):none

### **ENL1813S Communications I**

Communication remains an essential skill sought by employers, regardless of discipline or field of study. Using a practical, vocation-oriented approach, students focus on meeting the requirements of effective communication. Students practise writing, speaking, reading, listening, locating and documenting information, and using technology to communicate professionally. Students develop and strengthen communication skills that contribute to success in both educational and workplace environments.

Prerequisite(s): none

Corerequisite(s):none

**GED1615 General Education Elective**

Students choose one course, from a group of general education electives, which meets one of the following four theme requirements: Arts in Society, Civic Life, Social and Cultural Understanding, Personal Understanding, and Science and Technology.

Prerequisite(s): none

Corerequisite(s):none

**GED1615 General Education Elective**

Students choose one course, from a group of general education electives, which meets one of the following four theme requirements: Arts in Society, Civic Life, Social and Cultural Understanding, Personal Understanding, and Science and Technology.

Prerequisite(s): none

Corerequisite(s):none

**GED1615 General Education Elective**

Students choose one course, from a group of general education electives, which meets one of the following four theme requirements: Arts in Society, Civic Life, Social and Cultural Understanding, Personal Understanding, and Science and Technology.

Prerequisite(s): none

Corerequisite(s):none

**IMG0102 Radiological Protocols I**

Radiological protocols incorporate positioning skills, imaging principles and best practice standards for patient care. Students examine the fundamental principles of patient positioning skills for radiological procedures. Students develop a plan for procedural variations based on consultation requirements and patient needs. Detailed knowledge of anatomy and radiological techniques are integrated to optimize imaging procedures of the extremities and the respiratory system. Students assess radiological images to identify anatomy and pathology.

Prerequisite(s): none

Corerequisite(s):IMG0103

**IMG0103 Radiological Protocols Laboratory I**

Imaging protocols of the appendicular skeleton and the respiratory system are simulated using evidence-based decision making. Students apply safe and best practice to imaging protocols used in the clinical setting. Radiological technique and imaging concepts are applied to simulated clinical examples.

Prerequisite(s): none

Corerequisite(s):IMG0102

**IMG0110 Radiological Protocols Laboratory II**

Imaging protocols of the axial skeleton and the abdomen are practised and performed in a simulated environment. Students learn to adapt routine techniques based on consultation requirements. Best practice and safety protocols are implemented in a simulated clinical setting. Students perform problem solving of simulated clinical examples to determine adaptive techniques to optimize images.

Prerequisite(s): IMG0103

Corerequisite(s):IMG0133

**IMG0116 Radiological Protocols Laboratory III**

Simulation of protocols enables students to develop critical thinking skills. Students perform routine imaging protocols of the cranium. Students problem solve to adapt techniques as needed based on patient and consultation requirements. Students apply best and safe practice standards to adapt routine protocols for complex examinations and trauma imaging.

Prerequisite(s): IMG0110  
Corerequisite(s): IMG0145

**IMG0117 Pathology II**

Pathological principles are the link to various radiological appearances on medical images. Students examine pathological principles and relate these to the radiographic appearances on various medical images. Common pathologies, anomalies and conditions of the respiratory system, the cardiovascular system, the hemopoietic system, the neurological system and the reproductive system are described and recognized. Students relate patients and their clinical presentation to various case examples of radiographic pathologies. Students apply critical thinking and problem-solving strategies to best demonstrate pathologies.

Prerequisite(s): IMG0122  
Corerequisite(s): none

**IMG0118 Radiation Biology and Protection**

Radiation safety as a best practice standard is incorporated into each radiological examination. Students use evidence-based research to evaluate best practice guidelines for limiting radiation exposure to themselves, healthcare workers and the public in the clinical use of ionizing radiation. The structure of the cell is studied to relate the effects of radiation. Basic concepts of the types and sources of radiation and their relationship to biological effects are compared. Radiation quantities and units are related to biological effects on the human body. Equipment design and features are explored for radiation protection purposes.

Prerequisite(s): none  
Corerequisite(s): none

**IMG0119 Clinical Practicum 1**

Application of theory allows the student to progress from observing to performing assigned procedures while applying best practice principles under direct supervision in all areas of a radiological department. Professional behaviour including interprofessional collaboration is emphasized. Evidence-based practice guidelines are applied to analyze pathology, radiographic protocols and imaging concepts related to skeletal system cases. The review cases integrate related imaging disciplines and contrasting images from similar clinical cases.

Prerequisite(s): BIO0004 and IMG0116 and IMG0117 and IMG0118 and IMG0132 and IMG0139 and IMG0140 and IMG0142 and IMG0143 and IMG0144 and IMG0145 and IMG0146 and IMG0147 and IMG0148 and IMG1035  
Corerequisite(s): none

**IMG0120 Clinical Practicum 2**

Application of critical thinking and problem solving allows students to progress to remote supervision for common radiological procedures. Students apply best practice standards for assigned clinical experience. Students use critical thinking and problem solving to achieve optimal diagnostic images and provide optimal patient care. Students function as part of the collaborative healthcare team, incorporating reflective practice, time management and organizational skills into their clinical experience. Students apply evidence-based practice guidelines to analyze pathology, radiographic protocols and imaging concepts related to multiple system cases. The review cases integrate related imaging disciplines and contrasting images from similar clinical cases.

Prerequisite(s): IMG0119  
Corerequisite(s): none

**IMG0121 Clinical Practicum 3**

All imaging protocols as listed in the national competency profile are performed in a competent manner at the level expected for entry to practice. Students progress to perform skills under indirect supervision demonstrating independent problem solving and decision making for routine and non-routine procedures. Students function as part of the collaborative care team, incorporating time-management and organizational skills into daily department tasks while developing critical thinking and leadership skills. Students perform reflective practice and identify examples of alternative methods to achieve lifelong learning.

Prerequisite(s): IMG0120  
Corerequisite(s):none

**IMG0122 Pathology I**

Medical imaging is directly correlated to pathological changes of the human body. Using accurate medical terminology students describe pathological principles, such as cellular activities, and relate these to the radiographic appearances on various medical images. Common pathologies, anomalies and conditions of the skeletal system, the gastrointestinal system and the urinary system are described and recognized. Students relate patients' manifestation and clinical presentation to various case examples of radiographic pathologies. Students apply critical thinking and problem-solving strategies to evaluate technical adjustments to best demonstrate pathologies.

Prerequisite(s): none  
Corerequisite(s):none

**IMG0128 Quality Control for General Radiography**

Quality assurance in the imaging department is maintained to ensure the technical and diagnostic quality of images. Students analyze examples of quality control data and apply them to the clinical setting. Students use concepts of qualitative and quantitative data analysis to formulate hypothesis for quality control data as it applies to clinical setting. Regulations for quality assurance and control are studied with emphasis placed on quality control of image acquisition, radiographic/fluoroscopic equipment and ancillary equipment.

Prerequisite(s): none  
Corerequisite(s):none

**IMG0132 Contrast Media Agents and Intravenous Injection Skills**

Contrast media agents are commonly used for diagnostic and interventional examinations. The properties of contrast media and related drugs are examined. Students relate the use of contrast media for the purpose of diagnostic and interventional medical imaging. Students learn about clinical indications, contraindications and adverse reactions to contrast media and how to manage reactions. Students study the theory of venipuncture and practise, in a simulated environment, techniques of intravenous injection.

Prerequisite(s): none  
Corerequisite(s):none

**IMG0133 Applied Radiological Protocols**

Principles of patient positioning and technical requirements are applied to each radiological protocol. Students apply the concepts of anatomical and physiological variances to clinical examples of radiological methodology for the imaging of axial skeleton and the digestive and urinary systems. Students use critical thinking to adapt procedures to meet patient needs and to problem solve to optimize the image quality.

Prerequisite(s): IMG0102  
Corerequisite(s):IMG0110

**IMG0134 Computed Tomography-Physical Principles**

The knowledge of the physical components of CT technology allows the MRT to produce static and dynamic diagnostic images. Concepts of data acquisition and data management are correlated to the basic functions of each component of a computed tomography imaging system. Students explore post-processing applications that allow CT data to be displayed in various forms, in addition to multisectional display. The relationship between the selection of scan parameters and radiation dose is examined. Students analyze examples of quality control data and apply them to computed tomography clinical settings.

Prerequisite(s): IMG0141

Corerequisite(s):none

### **IMG0139 Imaging and Quality Control Laboratory**

Imaging principles application and quality control guidelines are replicated and evaluated. In a simulated environment, students apply the theory of imaging principles to demonstrate their relevance on radiographic images. Using the quality control regulations, students produce data required to examine the function of radiographic/fluoroscopic equipment and ancillary equipment. Theory, images and data are analyzed.

Prerequisite(s): IMG0128 and IMG0141

Corerequisite(s):none

### **IMG0140 Professional Practice Foundations for Imaging Technologist**

Professional values and behaviors establish an essential foundation for MRT practice. Concepts of wellness and healthy lifestyle are explored with a focus on stress and resilience. Strategies for professional integrity and accountability are developed to help the students with professional judgment, critical thinking and decision-making. Strategies to adapt communication techniques are explored. Cultural awareness and social responsibility as a health care professional are examined acknowledging the diverse history of the Indigenous population.

Prerequisite(s): none

Corerequisite(s):none

### **IMG0141 Introduction to Radiological Imaging Principles**

Knowledge of the properties of the x-ray beam is the foundation to its daily application as a medical radiation technologist. Using radiographic images, students study factors that influence the image quality including geometric and photographic properties. Students compare the properties of various image receptors and their uses.

Prerequisite(s): none

Corerequisite(s):none

### **IMG0142 Computed Tomography-Imaging Procedures and Protocols**

Computed tomography is a dedicated imaging modality used to identify disease or injury within different regions of the body. Analyzing case based scenarios and multi-sectional images, students explore various scanning protocols correlating technical principles with specific patient conditions and pathologies.

Prerequisite(s): BIO0003 and IMG0134

Corerequisite(s):none

### **IMG0143 Transition to Clinical Practice**

Professional practice standards in the clinical setting is an essential part of the technologist's integrity. Students explore professional practice strategies and best clinical practice guidelines for success in the clinical environment.

Prerequisite(s): none

Corerequisite(s):none

**IMG0144 Adaptive Imaging Principles**

Clinical conditions, procedural requirements, and diverse patient demographics require modifications in medical imaging. Using critical-thinking and problem-solving skills, students explore adaptive techniques for a variety of clinical situations.

Prerequisite(s): IMG0133

Corerequisite(s):none

**IMG0145 Advanced Radiological Procedures and Protocols**

Specialized imaging protocols require specific equipment and technical requirements. Students apply anatomy and physiology theory and imaging principles for radiographic imaging of the cranium. Students examine diagnostic and interventional procedures for multiple body systems.

Prerequisite(s): IMG0133

Corerequisite(s):IMG0116

**IMG0146 Imaging Systems, Acquisition, and Data Management**

Digital imaging technology incorporates unique techniques and specialized equipment. Students examine the operational components, design, and function of digital fluoroscopic and radiographic equipment. Data acquisition, processing techniques, and networking/archival systems common in the medical imaging department are investigated.

Prerequisite(s): IMG0141 and IMG0149

Corerequisite(s):none

**IMG0147 Advanced Patient Management for MRTs**

The delivery of safe quality patient care is required in all health care settings. Students explore specialized techniques to provide care and treatment while imaging to patients of a wide range of acute conditions, including injuries. Students examine the complex care needs for various patient demographics.

Prerequisite(s): IMG1038 and IMG1039

Corerequisite(s):none

**IMG0148 Introduction to Health Research**

Evidence-based practice involves critical appraisal of information used to answer a clinical question. Students explore research ethics, methodologies and various modes of data collection and presentation. Students learn to review and critique published research and reviews of published studies focusing on emerging technologies in healthcare and technological advancements in imaging.

Prerequisite(s): none

Corerequisite(s):none

**IMG0149 Medical Radiation Physics**

The technical and physical principles of the X-ray beam is the foundation for radiological technology. Students explore the essential principles of radiation physics including the properties of electromagnetic radiation. Students study the production of ionizing radiation as it pertains to the components and operation of radiological equipment.

Prerequisite(s): none

Corerequisite(s):none

**IMG1035 Professional Practice and Legislation for Medical Imaging Professionals**

Legislation and regulations govern the practice of the medical radiation technologist. Students gain



an understanding of the roles of professional associations, codes of ethics, scope of practice and evidence-based best practice standards. Professional behaviour expectations and ethical principles related to the professional roles within the healthcare team and the community are examined. Students explore strategies to endorse patient advocacy, social and cultural inclusion. Students explore different avenues for professional development associated to a professional QA program.

Prerequisite(s): none

Corerequisite(s):none

### **IMG1038 Patient Management for Medical Imaging Professionals**

Best practice standards guide the Medical Imaging Professional to provide care to the patient. Students learn the principles of conducting relevant patient assessment to recognize and adapt to diverse patient needs and similarly the legal documentation required. Transmission-based precautions and routine practices of infection control are investigated along with applicable procedures for patients with compromised immunity. Students explore various methods of patient transfers and transport and use of immobilization devices while using proper body mechanics. Students learn to recognize and respond to medical emergencies incorporating the use of assistive devices such as suctioning and oxygen therapy.

Prerequisite(s): none

Corerequisite(s):IMG1039

### **IMG1039 Patient Management Skills for Medical Imaging Professionals**

The support, care and understanding of the patient is the primary role of the Medical Imaging Technologist. Using case scenarios, students practise safe patient transfers and transport methods and apply basic patient assessment skills to ensure patient needs are met. With the use of proper patient interview techniques, the student will determine what interventions are required should a problem arise. Through simulation, the principles of infection control and prevention are rehearsed based on evidence-based infection control standards. Protocols for basic patient care, such as suctioning and monitoring of vital signs, insertion of rectal tubes along with proper departmental and legal documentation guidelines are performed. The students demonstrate effective communication strategies to deliver appropriate care in diverse patient populations.

Prerequisite(s): none

Corerequisite(s):IMG1038

### **IMG1041 Comprehensive Review for Certification Exam**

Students prepare for the national certification exam by completing a comprehensive review and a practice exam modelled on the national radiological technology competency profile. This review allows students to perform a systematic analysis of the curriculum and the national competency profile to identify specific areas for improvement.

Prerequisite(s): none

Corerequisite(s):none