Area of Interest: Health Sciences

Medical Radiation Technology

Ontario College Advanced Diploma
3 Years
Ottawa Campus

Academic Year: 2019/2020
Program Code: 1615X01FWO

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 EQalTM. 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 Radiation 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 while interacting with patients, their families and other members of the healthcare team.
- 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 Radiation Technologists of Ontario (CMRTO) to be eligible for employment in Ontario.

Learning Outcomes
The graduate has reliably demonstrated the ability to:

• Produce and assess a variety of high-quality diagnostic images employing current technologies for image acquisition and processing.
• Interpret requests and adapt procedures relative to patient and diagnostic image requirements in routine and complex clinical cases.
• Comply with relevant legislation, regulations and ethical standards for the best practice in diagnostic imaging.
• Employ accepted radiation, health and safety practices with self, patients, their families, and healthcare team members in a variety of clinical settings.
• 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.
• Monitor patients’ status at all times and respond to emergency situations where indicated.
• Operate, calibrate, set up, troubleshoot and evaluate a variety of complex equipment safely.
• Analyze a broad range of diagnostic imaging procedures to assist physicians in the diagnosis and management of multiple system disorders.
• Interact with patients, their families, the healthcare team members and the public using effective communication and interpersonal skills.
• 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.
• 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

<table>
<thead>
<tr>
<th>Level: 01</th>
<th>Courses</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO0002</td>
<td>Applied Anatomy and Physiology I</td>
<td>42.0</td>
</tr>
<tr>
<td>ENL1813S</td>
<td>Communications I</td>
<td>42.0</td>
</tr>
<tr>
<td>HLT0200</td>
<td>Health Ethics</td>
<td>42.0</td>
</tr>
<tr>
<td>IMG0100</td>
<td>Medical Radiation Sciences I</td>
<td>56.0</td>
</tr>
<tr>
<td>IMG0101</td>
<td>Introduction to Radiological Imaging Principles</td>
<td>56.0</td>
</tr>
<tr>
<td>IMG0102</td>
<td>Radiological Protocols I</td>
<td>84.0</td>
</tr>
<tr>
<td>IMG0103</td>
<td>Radiological Protocols Laboratory I</td>
<td>42.0</td>
</tr>
<tr>
<td>IMG0130</td>
<td>Clinical Practicum 1</td>
<td>28.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level: 02</th>
<th>Courses</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Hours</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------------------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>BIO0003</td>
<td>Applied Anatomy and Physiology II</td>
<td>42.0</td>
</tr>
<tr>
<td>IMG0108</td>
<td>Image Processing and Management</td>
<td>56.0</td>
</tr>
<tr>
<td>IMG0110</td>
<td>Radiological Protocols Laboratory II</td>
<td>42.0</td>
</tr>
<tr>
<td>IMG0112</td>
<td>Clinical Practicum II</td>
<td>150.0</td>
</tr>
<tr>
<td>IMG0118</td>
<td>Radiation Biology and Protection</td>
<td>28.0</td>
</tr>
<tr>
<td>IMG0122</td>
<td>Pathology I</td>
<td>28.0</td>
</tr>
<tr>
<td>IMG0124</td>
<td>Advanced Medical Radiation Sciences</td>
<td>42.0</td>
</tr>
<tr>
<td>IMG0128</td>
<td>Quality Control for General Radiography</td>
<td>28.0</td>
</tr>
<tr>
<td>IMG0131</td>
<td>Adaptive Radiological Protocols</td>
<td>42.0</td>
</tr>
<tr>
<td>IMG0133</td>
<td>Applied Radiological Protocols</td>
<td>70.0</td>
</tr>
<tr>
<td>IMG0138</td>
<td>Patient Management for Medical Imaging Professionals</td>
<td>14.0</td>
</tr>
<tr>
<td>IMG0139</td>
<td>Patient Management Skills for Medical Imaging Professionals</td>
<td>14.0</td>
</tr>
</tbody>
</table>

Choose one from equivalencies:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GED0615</td>
<td>General Education Elective</td>
<td>42.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level: 03</th>
<th>Courses</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO0004</td>
<td>Applied Anatomy and Physiology III</td>
<td>42.0</td>
</tr>
<tr>
<td>ENL0064</td>
<td>Professional Communication Skills for Medical Radiation Technologists</td>
<td>42.0</td>
</tr>
<tr>
<td>IMG0116</td>
<td>Radiological Protocols Laboratory III</td>
<td>42.0</td>
</tr>
<tr>
<td>IMG0117</td>
<td>Pathology II</td>
<td>28.0</td>
</tr>
<tr>
<td>IMG0127</td>
<td>Specialized Radiological Protocols</td>
<td>42.0</td>
</tr>
<tr>
<td>IMG0132</td>
<td>Contrast Media Agents and Intravenous Injection Skills</td>
<td>14.0</td>
</tr>
<tr>
<td>IMG0134</td>
<td>Computed Tomography - Physical Principles</td>
<td>28.0</td>
</tr>
<tr>
<td>IMG0135</td>
<td>Computed Tomography - Clinical Applications</td>
<td>28.0</td>
</tr>
<tr>
<td>IMG0136</td>
<td>Imaging and Health Care Technologies</td>
<td>42.0</td>
</tr>
<tr>
<td>IMG0135</td>
<td>Professional Practice and Legislation for Medical Imaging Professionals</td>
<td>28.0</td>
</tr>
</tbody>
</table>

Level: 04 Courses

- IMG0119   | Clinical Practicum III                           | 562.5 |

Level: 05 Courses

- IMG0120   | Clinical Practicum IV                            | 562.5 |

Level: 06 Courses

- IMG0121   | Clinical Practicum V                             | 487.5 |
| IMG1041    | Comprehensive Review for Certification Exam      | 66.0  |

Fees for the 2019/2020 Academic Year

Tuition and related ancillary fees for this program can be viewed by using the Tuition and Fees Estimator tool at [http://www.algonquincollege.com/fee-estimator](http://www.algonquincollege.com/fee-estimator).

Further information on fees can be found by visiting the Registrar’s Office site at [http://www.algonquincollege.com/ro](http://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 Radiation Technology of Ontario (CMRTO) with a preregistration fee of $105 (subject to change). The Canadian Association of Medical Radiation Technologists (CAMRT) national certification exam fee is $840 with an additional test centre fee of $150.41 plus tax.

All fees are based on 2019 costs and are subject to change.

**Admission Requirements for the 2020/2021 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
- Academic and Career Entrance (ACE) certificate; 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) 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 through the Test Centre, and will be required to pay the current fee of $50 (subject to change). Results from the health program assessment will be utilized to establish minimum eligibility and also ranked, with the highest ranked applicants given priority admission. The health program assessment can only be written once per academic cycle.
- International applicants must provide proof of the subject specific requirements noted above along with proof of either: (IELTS / TOEFL) 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.
- Applicants with international transcripts must provide proof of the subject specific requirements noted above and may be required to provide proof of language proficiency.

**ACCEPTED APPLICANTS MUST:**
- Provide evidence of a current Cardio-Pulmonary Resuscitation Training
- C.P.R. Basic Rescuer `C` Level certification and Standard First Aid certification.
- Submit a Health Assessment Form and provide an Immunization Certificate prior to entry to the program. 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.
- Students in the program will be 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.
• **Police Records Check Documentation:**
  Though not an admission requirement, applicants must note important information listed below regarding Police Record Check program requirements.

Successful completion of clinical placement is a requirement for graduation from the Medical Radiation Technology program. Agencies that provide placement opportunities require you to have a clear Police Records Check for Service with the Vulnerable Sector (PRCSV)S. Your acceptance for placement is at the discretion of the agency. If you register in the program without a clear PRCSV and as a result are unable to participate in placement, you will not be able to graduate.

**Lab and Placement Eligibility:**
To be eligible to participate in lab and placement activities, you must submit proof of a clear (PRCSV).

It is your responsibility to obtain the PRCSV 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.

**Admission Requirements for 2019/2020 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

• Academic and Career Entrance (ACE) certificate; 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) 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 through the Test Centre, and will be required to pay the current fee of $50 (subject to change). Results from the health program assessment will be utilized to establish minimum eligibility and also ranked, with the highest ranked applicants given priority admission. The health program assessment can only be written once per academic cycle.

• International applicants must provide proof of the subject specific requirements noted above along with proof of either: (IELTS / TOEFL) 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.

• Applicants with international transcripts must provide proof of the subject specific requirements noted above and may be required to provide proof of language proficiency.

**ACCEPTED APPLICANTS MUST:**

• Standard First Aid - you must have a valid Standard First Aid certificate which is valid for a three (3) year period and a Health Care Provider (HCP) CPR C and Automated External
• Standard First Aid - you must have a valid Standard First Aid certificate which is valid for a three (3) year period and a Health Care Provider (HCP) CPR C and Automated External Defibrillation (AED) Certification in order to attend any clinical practice which must remain current for each academic year of your program until graduation. Please note that CPR certification course is specifically designed for Health Care Professionals, course provides training on skills required for Adult, Child, & Infant Resuscitation; One & Two Rescuer, First Aid for Choking, proper use of barrier devices in resuscitation, AED and Bag Valve Mask. Please note that on-line CPR courses do not meet the re-certification standards required for your program.

• Submit a Health Assessment Form and provide an Immunization Certificate prior to entry to the program. 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.

• Students in the program will be 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.

Police Records Check Documentation:
Though not an admission requirement, applicants must note important information listed below regarding Police Record Check program requirements.

Successful completion of clinical placement is a requirement for graduation from the Medical Radiation Technology program. Agencies that provide placement opportunities require you to have a clear Police Records Check for Service with the Vulnerable Sector (PRCSVS). Your acceptance for placement is at the discretion of the agency. If you register in the program without a clear PRCSVS and as a result are unable to participate in placement, you will not be able to graduate.

Lab and Placement Eligibility: To be eligible to participate in lab and placement activities, you must submit proof of a clear (PRCSVS).

It is your responsibility to obtain the 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.

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
Medical Radiation Technology

The College of Medical Radiation 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.cmrto.org/resources/forms/app-ontario-grad.

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

Timetable: Timetable for the program includes days, evenings and weekends.

Contact the Program Coordinator, Sylvie Ferguson at 613-727-4723 ext. 3568 or mailto:ferguss@algonquincollege.com or Program Support, Sherri Pagnan at 613-727-4723 ext. 5078 or mailto:pagnans@algonquincollege.com.

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

**GED0615 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, Social and Cultural Understanding, Personal Understanding, and Science and Technology.

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

**HLT0200 Health Ethics**

Students explore the evolution of health-care and the role society has asked of it throughout history. The current structure of the Canadian healthcare system including levels of healthcare, healthcare regulation and funding are reviewed. Students review the role of healthcare in meeting health related needs throughout individuals’ lifespan. Health research processes and ethical issues within research are also examined. Through self-reflective assessments and collaboration, students explore euthanasia, alternate healthcare practices, and public versus private healthcare provision relative to society's mores.

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

**IMG0100 Medical Radiation Sciences I**

The relationship between electromagnetism and radiation is a vital component to the field of radiography. Using examples, students explore the factors affecting the quality and the quantity of the radiation beam. Students study the components and operation of the x-ray tube and analyze the interaction between matter and electromagnetic radiation.

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

**IMG0101 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
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): none

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

IMG0108 Image Processing and Management

The application of software and computers is integrated in the daily function of a medical radiation technologist. Students differentiate between standards for various computerized systems that are used in the management of imaging protocols. Information and storage systems, such as the Radiology Information System (RIS) and the Picture Archive Communication System (PACS) are reviewed.

Prerequisite(s): IMG0101
Corerequisite(s): none

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): none
Corerequisite(s): IMG0133

IMG0112 Clinical Practicum II

Applied best practice principles and theory of radiological protocols allow the student to integrate themselves as a functional member of the healthcare team in various areas of a radiological department. Under direct supervision, students apply theory to radiological protocols demonstrating best practice principles. Through scenarios, students explore interprofessional practice, communication strategies, professional judgement and decision making, workflow prioritization, stress management and adaptive protocols while maintaining safe radiation practices.

Prerequisite(s): IMG0110 and IMG0130 and IMG1038 and IMG1039
Corerequisite(s): none

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.
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 III

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 IMG0108 and IMG0112 and IMG0116 and IMG0117 and IMG0118 and IMG0126 and IMG0132 and IMG0134 and IMG0135 and IMG0136
Corerequisite(s): none

IMG0120 Clinical Practicum IV

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 V

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. Students perform reflective practice and identify examples of alternative methods to achieve lifelong learning. Students also prepare for the national certification exam by completing a comprehensive review and a practice exam modelled on the national radiological technology competency profile. Exam review allows students to identify specific areas for improvement.

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

**IMG0124 Advanced Medical Radiation Sciences**

The design of imaging equipment and the planning of imaging rooms have varying purposes and functions based on the examination performed. Students explore the function and operation of equipment required to perform specialized diagnostic procedures, focusing on fluoroscopy. Students study the design and safety requirements of imaging rooms to meet applicable standards.

Prerequisite(s): IMG0100
Corerequisite(s): none

**IMG0127 Specialized Radiological Protocols**

Specialized protocols require an advanced level of knowledge and technique that differs considerably from general practice. Students apply anatomy and physiology theory to radiological methodology for imaging the cranium. Specialized imaging procedures including trauma and angiography are analyzed. Students use critical-thinking and problem-solving skills to adapt procedures to patient needs and to optimize the image quality.

Prerequisite(s): IMG0131 and IMG0133
Corerequisite(s): IMG0116

**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): IMG0100
Corerequisite(s): none

**IMG0130 Clinical Practicum 1**

Observation of the clinical environment and the professional roles and responsibilities of all members of the healthcare team allows the student to understand the profession of the medical radiation technologist. A basic understanding of patient needs and management skills is developed. Students observe the use of imaging equipment and use critical-thinking to critique radiographic protocol applications. Students prepare for clinical training through concepts of basic infection control, emergency codes, privacy and non-violent crisis intervention.
**IMG0131 Adaptive Radiological Protocols**

Patient condition and procedural requirements dictate adaptive techniques used for imaging. Various patient populations, including pediatric and geriatric are compared relative to imaging protocols used. Specialized equipment and diverse imaging environment applied to mobile and surgical imaging are examined for diverse technical requirements. Students study radiography of therapeutic lines and tubes utilizing best practice guidelines.

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): none

**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 multi-sectional 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): none  
Corerequisite(s): none

**IMG0135 Computed Tomography - Clinical Applications**

Computed tomography is a specialized modality that links the basic concept of body section radiography with a computer system to produce diagnostic images for specific pathologies. Students study safe and effective scanning practices for thoracic, abdominal, abdominopelvic, neuro and MSK procedures based on related pathologies and patient condition. Cross-sectional images of various planes are critiqued related to selected protocols.

Prerequisite(s): none  
Corerequisite(s): none
**IMG0136 Imaging and Health Care Technologies**

Awareness of emerging technologies in health care allows the medical radiation technologist to assist and educate the patients. Current technologies in health care and in the medical imaging field are researched with a focus on their applications and functions. Research principles, ethics and methods are applied to current and emerging technologies in health care. Students contrast the function and operation of equipment required to perform specialized diagnostic procedures. Imaging and therapeutic modalities, such as magnetic resonance imaging, are compared with a focus on best practices and current trends in imaging technology.

Prerequisite(s): IMG0134  
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 discussed. Social and cultural awareness as it relates to the sensitivity of diversity in the workplace is examined. Students explore different avenues for professional development associated to a professional QA program.

Prerequisite(s): none  
Corerequisite(s): IMG1001 and IMG1002 and IMG1003 and IMG1004 and IMG1016 and IMG1019 and IMG1034

**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): IMG1000 (1) and IMG1002 (1) and IMG1023 (1) and IMG1024 (1) and IMG1025 (1)  
Corerequisite(s): none

**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