Medical Radiography Technology

Clinical Integration 2

COURSE INFORMATION

COURSE NUMBER	**MRAD 360**
TOTAL HOURS	**50**
THEORY	**50**
PRACTICAL	**0**
PREREQUISITES	**MRAD 285 - Radiographic Applied Skills** **INFC 215 - Infection Prevention and Control** **QUAL 370 - Quality Assurance and Control** **MRAD 302 - Specialized Imaging 2** **MRAD 209 - Professional Practice 1** **MRAD 281 - Computed Tomography Theory 2** **PRCT 356 – Clinical Placement II**
CO-REQUISITES	**None**
ACADEMIC UNIT RESPONSIBLE FOR COURSE	**Allied Health Education**

STUDENTS, PLEASE NOTE

This course contains information that may be required to substantiate learning for professional recognition. It is your responsibility to retain a copy for your own use during your program and after graduation.

COURSE DESCRIPTION

Clinical Integration 2 builds upon Clinical Integration 1 with more technologically-advanced concepts related to medical radiologic technology imaging being presented. Opportunities are provided for the learner to integrate theoretical concepts in a clinical environment. Preparation for the national Canadian Association of Medical Radiologic Technologists (CAMRT) exam will also be covered. By combining hands-on training in the clinical setting with online learning, students can benefit from a more flexible learning experience.

COURSE OBJECTIVES

Following completion, the student will be able to:

1. Explain key concepts and tests needed for quality assurance programs.
    - 1.1 Describe the components that make up resource management.
    - 1.2 Describe the key components of a quality assurance program.
    - 1.3 Describe the safety recommendations and tests done to evaluate the operation of the x-ray tube and generator.
    - 1.4 Describe the safety recommendations and tests done to evaluate accessory equipment.
    - 1.5 Describe the safety recommendations and tests done to evaluate the operation of a fluoroscopy unit.
    - 1.6 Describe the safety recommendations and tests done to evaluate the operation of other specialized equipment.

2. Explain key concepts needed to operate radiographic equipment for generating high quality radiographic images.
    - 2.1 Explain the role of the parts in an x-ray tube and how they produce the x-ray beam.
    - 2.2 Plan an exposure based on equipment type, patient type and body part using appropriate technique variables.
    - 2.3 Describe how image formation occurs for both digital and film exposure.
    - 2.4 Compare how the different prime factors and patient variables affect image quality.
    - 2.5 Explain processing and post-processing of the image.
    - 2.6 Relate artifacts on the image to what causes them to occur.
    - 2.7 Explain a picture archiving and communication system (PACS) and its components.

3. Explain key concepts and best practices needed to position patients for high quality radiographic images.
    - 3.1 Explain positioning for the upper limb and shoulder girdle with respect to patient position, view/projections, adaptations, anatomy, and image quality.
    - 3.2 Explain positioning for the lower limb and pelvic girdle with respect to patient position, view/projections, adaptations, anatomy, and image quality.
    - 3.3 Explain positioning for the chest and abdomen with respect to patient position, view/projections, adaptations, anatomy, and image quality.

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3.4 Explain positioning for the vertebral column with respect to patient position, view/projections, adaptations, anatomy, and image quality.
3.5 Explain positioning for the thorax with respect to patient position, view/projections, adaptations, anatomy, and image quality.
3.6 Explain positioning for the skull and facial bones with respect to patient position, view/projections, adaptations, anatomy, and image quality.

4. Minimize radiation exposure to patients, personnel, and the general public.
4.1 Describe the physical properties of radiation, how it interacts with matter and its biological effects.
4.2 Explain radiation safety procedures and the as low as reasonably achievable (ALARA) concept.
4.3 Describe the design consideration of the physical environment for minimizing radiation exposure.
4.4 Describe the safety procedures and effects of radiation on pregnant patients and technologists.
4.5 Identify the safety procedures used to protect patients and the general public.
4.6 Identify the safety procedures used to protect staff.
4.7 Identify the safety procedures used in fluorography and specialized modalities.

5. Ensure professional standards and quality patient care.
5.1 Identify what is involved promoting and maintaining professional behaviour.
5.2 Explain the importance of the Code of Ethics, Standards of Practice as they relate to patient rights and professional practice.
5.3 Describe how effective communication and trust increase patient care and professional standards.
5.4 Apply critical thinking to adaptive radiology and trauma situations.
5.5 Describe how to maximize patient care using risk management guidelines.
5.6 Provide information and guidance for students in the medical radiation technology workplace.

6. Explain best practices of patient care and the skills required.
6.1 Describe the administrative procedures and legal concerns with regard to patient identification and documentation.
6.2 Explain the proper body mechanics and patient transfer procedures.
6.3 Explain surgical asepsis and the different isolation techniques.
6.4 Differentiate medical accessory equipment with regard to function, precautions, and appearance on
radiographic images.
6.5 Compare the different types of contrast based on patient history, safety measures and body system.

6.6 Describe different pharmaceuticals based on type, generic and trade name, route of delivery and purpose.

6.7 Explain what to do for medical emergencies.

7. Review the key concepts needed to generate high quality specialized radiographic images.

7.1 Describe the equipment, safety considerations and post-processing for vascular imaging.

7.2 Explain the parts of the computed tomography unit, how images are generated and post-processing considerations.

7.3 Describe the various computed tomography procedures with respect to patient preparation, safety procedures and images produced.

7.4 Compare the differences in mammography equipment and procedures to regular radiography equipment and procedures.

7.5 Explain the theory, equipment, and images for bone mineral density (BMD) procedures.

7.6 Describe other modalities that produce diagnostic images.

7.7 Identify adaptations to procedures and techniques that may be required in order to examine geriatric patients.

7.8 Identify adaptation to procedures and techniques that are required in order to examine pediatric patients.

8. Distinguish various pathologies based on their etiology, signs, symptoms, and radiographic appearance.

8.1 Identify various pathologies based on radiographic appearance.

8.2 Describe the etiology of selected pathologies.

8.3 Describe the signs and symptoms of selected pathologies.

8.4 Describe any adaptations that need to be made to patient care and image acquisition for patients with selected pathologies.

9. Critique radiographic images with regard to positioning, anatomy, pathology, and diagnostic quality.

9.1 Identify views and projections of radiographic images.

9.2 Determine if the positioning is in error and if so, what needs to be done to correct it.

9.3 Identify radiographic anatomy.

9.4 Describe adaptations that need to be made to patient care and image acquisition for selected pathologies.

9.5 Determine if an image is diagnostic.

9.6 Identify changes needed to correct the diagnostic quality of selected images.

COMMON STUDENT LEARNING OUTCOMES

Upon successful completion of Anderson College programs, the student will:

Learn

Students will actively and independently acquire, apply, and adapt skills and knowledge to develop

expertise and a broader understanding of the world as lifelong learners.

Think

Students will think analytically and creatively to explore ideas, make connections, draw conclusions, and solve problems.

Communicate

Students will exchange ideas and information with clarity and originality in multiple contexts.

Integrate

Students will demonstrate proficiency in the use of technologies in the broadest sense related to their field of study.

Act

Students will act purposefully, reflectively, and respectfully in diverse and complex environments.

EVALUATION

COLLEGE GRADING SYSTEM

The student must achieve an overall minimum grade of 70% on course assessments to be successful.

Students who achieve a failing grade of less than 70% may be eligible to write a supplemental examination to gain course credit. Remedial assistance will be required prior to writing the supplemental examination. Students will not progress in the program without achieving a passing grade in the course.

COURSE EVALUATION

Quizzes (3)	30%
Review Exams (2)	70%
TOTAL	**100%**

ASSESSMENT RATIONALE/ CRITERIA

Achievement of learning outcomes will be assessed through class participation, class work, group activity, assignment, tests, project, mid-semester examination, and end of semester examination. Assessment will require students to demonstrate understanding and application of all the topics taught.

LEARNING MATERIALS

REQUIRED TEXTS

To be determined by the instructor.

SUGGESTED READINGS

To be determined by the instructor.

REFERENCE TEXTS AND MATERIALS

To be determined by the instructor.

TEACHING/LEARNING STRATEGIES

Lectures on all the topics, power point presentations, video presentations, classwork, assignments, groupwork. All the students are expected to familiarise themselves with foundational knowledge prior to class. Personal study before and after classes and use of online resources are essential.

COLLEGE POLICY STATEMENTS

Refer to the Anderson College Student Handbook for more information on the following policies.

ACADEMIC RESPONSIBILITY – STUDENTS

1. Each student must know the due dates for assignments, tests, and examinations.
2. Each student must maintain their own academic record of work covered each Unit/term.
3. Each student must maintain paper and electronic copies of assignments for the academic year.
4. Each student must arrange academic discussion time with a faculty member to discuss progress.
5. Each student must perform self-evaluation on progress in the course.

PERSONAL CONDUCT – STUDENTS

1. Students must arrive on time for class and be prepared to work when the instructor begins.
2. Students must be courteous to faculty and classmates.
3. Eating in classrooms and clinic is not allowed.
4. Cell phones, Text messengers and other electronic devices must be turned off during class time.

ACADEMIC ADVANCEMENT

At mid-point and at the end of each academic term, the members of the Faculty Team (FT) for the Medical Radiography Technology program meet to review the progress of all students. Following these meetings each student is advised orally and in writing of their status in the program.

Students experiencing difficulty will be counseled regarding assistance available to foster academic success.

At the end of each term, the Medical Radiography Technology Program Instructor and or Director of Education will make recommendations after deliberating on all relevant information. Decisions regarding each student may include (but are not limited to) the following. S/he has:

- Successfully completed all program requirements and can graduate.
- Successfully completed all requirements and is promoted to the next academic level in the program.
- Been granted supplemental privileges for courses not successfully completed and if successful will graduate or be promoted to the next academic level. **Supplemental privileges are not automatically granted and will be limited in number.**
- Not successfully completed all elements in the academic level but may remain in the program to repeat failed portions and continue toward program completion according to an individualized timetable.
- Experienced such difficulty that repetition of the entire academic level is required, and a space will be provided for the student in the program at the earliest opportunity if the student wants to return.
- Experienced such difficulty that the student is asked to leave the school and if s/he desires readmission must complete the admissions process in competition with other applicants.

ATTENDANCE

Attendance is mandatory – The College reserves the right to determine whether absences are excused or unexcused (may affect student funding) and to request any medical evidence that may be required. Student tardiness is unacceptable, and students are expected to demonstrate professional behaviour at all times, in class or on a clinical placement. Students are entirely responsible for catching up on their own or for missed material and demonstrations. A doctor's note may be requested for each absence.

Absence from Missed Test/Assignment Due Protocol

Upon return to school, the student is to provide a doctor's note or approved excusable absence to the instructor prior to admission to the make up test/submission of late assignments. Failure to submit an approved excuse within 5 school Units upon return, the student will receive a zero for all missed, tests and late assignments.

Absence from Class Protocol

The College monitors attendance closely. A student who is absent from a class more than 3 times in a term, will be identified at risk and required to submit a doctor's note or approved excusable absence to their instructor(s) and the Program Instructor prior to readmission to the class.

Make-Up Procedure

All students are expected to take exams at the scheduled time. Make-up exams will be arranged only in recognized emergency cases. The instructor must be informed before or during the exam, to be eligible. Refer to the Anderson College Student Handbook for protocols. Quizzes are taken in class and at the time specified by the instructor. Late students will be given no extra time for the quiz. Quizzes given in the classroom cannot be made-up.

CHEATING AND PLAGIARISM

Any evidence of cheating will result in a failure for the course. Evidence of plagiarism will result in a failure for all students involved in the plagiarism. Plagiarism is turning in the work of someone else as if it was your own. When working on assignments in a group setting, students must submit their assignments using their own words. Identically worded assignments submitted by multiple students are acts of plagiarism.

MOBILE PHONES

Mobile phones are to be turned completely OFF while class is in session. Please use laptop computers responsibly. Web browsing, messaging, emailing, and recording are otherwise prohibited during class. Students who abuse the privilege of using their laptops will be asked to put it away for the duration of the class.