

# CLASS SYLLABUS



COURSE TITLE: MRAD 157 – Advanced Procedures  
CLASS SECTION: X01A-X01D  
TERM: S2023  
COURSE CREDITS: 3  
DELIVERY METHOD(S): Synchronous

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<https://camosun.ca/about/covid-19-updates>

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*Camosun College requires mandatory attendance for the first class meeting of each course. If you do not attend, and do not provide your instructor with a reasonable explanation in advance, you will be removed from the course and the space offered to the next waitlisted student.*

## INSTRUCTOR DETAILS

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NAME: Brent McMillen and Meggan Pohanka  
EMAIL: [McMillenB@camosun.ca](mailto:McMillenB@camosun.ca) and [PohankaM@camosun.ca](mailto:PohankaM@camosun.ca)  
OFFICE: CHW 317 or virtual  
HOURS:

*As your course instructor, I endeavour to provide an inclusive learning environment. However, if you experience barriers to learning in this course, do not hesitate to discuss them with me. Camosun College is committed to identifying and removing institutional and social barriers that prevent access and impede success.*

## CALENDAR DESCRIPTION

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In this advanced beginner course, students synthesize academic and clinical concepts to develop adaptive radiography skills. In the laboratory setting, students simulate complex examinations using phantoms and laboratory partners and create radiographic exposure charts. Students explore specialty imaging modalities in preparation for more complex patient encounters during their final two clinical practicums. Students who successfully demonstrate critical clinical safety indicators and problem-solving skills while simulating advanced radiographic procedures will progress to the advanced beginner clinical practicum.

**Note:** Only open to students in the Medical Radiography program.

PREREQUISITE(S): **All of:** C+ in MRAD 117; COM in MRAD 130  
CO-REQUISITE(S): MRAD 148  
PRE/CO-REQUISITE(S): **All of:** C+ in MRAD 156; C+ in MRAD 159; C+ in AHLT 165; C+ in MRAD 173

## COURSE DELIVERY

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ACTIVITY	HOURS / WEEK	# OF WEEKS	ACTIVITY HOURS
Lecture	3	15	
Seminar			
Lab / Collaborative Learning	6	15	
Supervised Field Practice			
Workplace Integrated Learning			
Online			
	TOTAL HOURS		135

## COURSE LEARNING OUTCOMES

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Upon successful completion of this course a student will be able to:

- demonstrate correctly positioned radiographic projections on phantoms and laboratory partners for specialized radiographic examinations of the body requiring adaptations.
- apply the components of a radiographic examination to complex patient scenarios encountered during their remaining clinical practicum experiences, including specialty imaging modalities.
- develop a systematic approach to adapting radiographic examinations to complex patient scenarios.
- apply and convey corrective actions to sub-optimal radiographic images of the body in pursuit of optimal radiographs.

## COURSE OBJECTIVES AND MAPPED PROFESSIONAL COMPETENCIES

(also known as “sub-outcomes” or “learning objectives”)

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Canadian Association of Medical Radiation Technologists Competency Profile, Radiological Technology (2019)

### Module 1 – Introduction

Review MRAD 117 and expectations for lab, MRAD 157 and sharing clinical experience

### Module 2 – (1 week) Mandible and Special Facial Bones

2.1 List the essential projections for the \_\_\_\_\_ (body part). RTR.3.3

2.2 List proper (technical and positioning) parameters (IR size, SID, CR, collimation, marker location, kvp, breathing instructions, grid, body and part position, other) to obtain an optimal image for essential projections of the \_\_\_\_\_ (body part) RTR.3.3, RTR.4.4

2.3 Describe the image evaluation criteria for essential projections of the \_\_\_\_\_ (body part). RTR.6.1, RTR.6.3, RTR.6.5, RTR.6.6, RTR.6.7, RTR.6.8

2.4 Compare and contrast essential projections of the \_\_\_\_\_ (body part).

2.5 Identify essential projections of the \_\_\_\_\_ (body part) using a radiograph.

2.6 Recognize and correct common positioning errors of the essential projections of the \_\_\_\_\_ (body part). RTR.6.8

2.7 Recognize and describe patient conditions (ie. acuity and habitus, etc.) that will require adaptation to the essential projections of the \_\_\_\_\_ (body part) to obtain an optimal image. (positioning and technical) RTR.4.5, 4.3.5, 5.3.1

2.8 Perform adaptations to the essential projections of the \_\_\_\_\_ (body part) in a simulated laboratory experience. 4.3.2, 4.1.3, RTR.2.2, RTR.2.3, RTR.4.3, RTR.4.4, RTR.4.6, RTR.6.8

2.9 Describe and perform workflow (including pre and post procedural care) for the essential exams of the \_\_\_\_\_ body part. 2.1.6, 2.2.4, 2.2.5, 3.1.5, 4.1.1, 4.2.1, 4.2.2, 4.2.3, RTR.2.5, RTR.4.2, RTR.6.9

- 2.10 Name and Identify relevant anatomical landmarks for the essential projections of the \_\_\_\_\_ (body part). **RTR.4.3**
- 2.11 Apply knowledge of relational anatomy for each essential projection of the \_\_\_\_\_ (body part). **RTR.4.3**
- 2.12 Demonstrate proper positioning for essential projections of the \_\_\_\_\_ (body part) in a simulated laboratory experience.
- 2.13 Demonstrate radiation protection (ALARA) during simulated laboratory experiences. (Collimation, lead protection, technical factors). **RTR.1.1, RTR.1.3, RTR.1.5, RTR.1.7**
- 2.14 Name and identify image evaluation criteria for essential projections of the \_\_\_\_\_ (body part) using a radiograph.
- 2.15 Identify errors on x- rays of the essential projections of the \_\_\_\_\_ (body part) and list corrective actions required.
- 2.16 Perform x-ray examinations of essential and non-essential projections of the \_\_\_\_\_ (body part) using all/some of the components of a radiographic exam in a simulated lab experience. **RTR.4.8**

### **Module 3 – (1 week) Adaptive Radiography Intro, Adapting Technique, and EI**

#### Adaptive Radiography Technical Factors

- 3.1 Describe the relationship between mAs and quantity of radiation.
- 3.2 Compare and contrast the relationship between mAs and film/screen and digital.
- 3.3 List the minimum amount of change needed to see a visible change and explain why we use more.
- 3.4 Define Exposure Indicator value.
- 3.5 Describe the relationship between kVp and the radiographic image.
- 3.6 List, explain, and apply the kVp 15% rule.
- 3.7 Explain what kVp depends on.
- 3.8 Describe the pros and cons of increasing kVp.
- 3.9 Describe the relationship between SID and beam intensity.
- 3.10 List, explain, and apply the inverse square law.
- 3.11 Describe the relationship between SID and mAs.
- 3.12 List, explain, and apply the mAs/distance compensation formula.
- 3.13 List the equation for SID.
- 3.14 List and describe other effects of SID.
- 3.15 Describe magnification factor.
- 3.16 List, explain and apply the object size equation.
- 3.17 Describe and explain the relationships grids have with scatter, contrast and the image receptor exposure.
- 3.18 List grid conversion factors for specific grid ratios.
- 3.19 List, explain, and apply the grids equation formula.
- 3.20 Explain the difference between different generator outputs and how this affects technical factor adjustments.
- 3.21 List and identify the different body habitus.
- 3.22 Describe the affect patient thickness has on beam attenuation.
- 3.23 List, explain, and apply the part thickness formula.
- 3.24 Explain what technical adjustments will be needed for pediatric/geriatric patients.
- 3.25 Explain what technical adjustments will be needed for casts.
- 3.26 Describe the types of pathological conditions and give examples of each.
- 3.27 Adjust technical factors for each type of pathological condition
- 3.28 Compare and contrast adaptations for pediatric and geriatric populations
- 3.29 Apply equations to adjust for adaptive cases.

#### Exposure Indices:

- 3.30 Define Exposure Indicators.
- 3.31 Identify what exposure indicators we have in lab and clinical and the relationships they have with the number of photons striking the IR. (Inversely or directly proportional).
- 3.32 Explain why there are different EIs for different manufacturers.
- 3.33 Explain why we have Exposure Indicators.
- 3.34 Define exposure latitude, histogram, algorithm, LUT, digitization.
- 3.35 Describe how to obtain the LUT for the Fuji reader and GE room.
- 3.36 List the steps for image acquisition for CR and DR machines.
- 3.37 Explain the steps for image acquisition for CR and DR machines
- 3.38 Compare and contrast the image acquisition for the CR and DR machines.
- 3.39 Identify and label the x and y axis for a histogram graph.
- 3.40 Define S1 and S2 and tail as related to histogram formation.
- 3.41 Identify S1 and S2 and tail on a histogram graph.
- 3.42 List Guidelines for optimal histograms.
- 3.43 Describe auto-rescaling.
- 3.44 Describe what to do if EI is in the acceptable range.
- 3.45 Describe what to do if EI is not in acceptable range.
- 3.46 Define saturation.
- 3.47 Describe and explain examples of histogram errors.

#### **Module 4 – (1 week) Chest, bony Thorax, Abdomen – Adaptive**

##### **[Mapped same as module 2](#)**

- 4.1 List the essential projections for the \_\_\_\_\_ (body part).
- 4.2 List proper (technical and positioning) parameters (IR size, SID, CR, collimation, marker location, kvp, breathing instructions, grid, body and part position, other) to obtain an optimal image for essential projections of the \_\_\_\_\_ (body part)
- 4.3 Describe the image evaluation criteria for essential projections of the \_\_\_\_\_ (body part).
- 4.4 Compare and contrast essential projections of the \_\_\_\_\_ (body part).
- 4.5 Identify essential projections of the \_\_\_\_\_ (body part) using a radiograph.
- 4.6 Recognize and correct common positioning errors of the essential projections of the \_\_\_\_\_ (body part).
- 4.7 Recognize and describe patient conditions (ie. acuity and habitus, etc.) that will require adaptation to the essential projections of the \_\_\_\_\_ (body part) to obtain an optimal image. (positioning and technical)
- 4.8 Perform adaptations to the essential projections of the \_\_\_\_\_ (body part) in a simulated laboratory experience.
- 4.9 Describe and perform workflow (including pre and post procedural care) for the essential exams of the \_\_\_\_\_ body part.
- 4.10 Name and identify relevant anatomical landmarks for the essential projections of the \_\_\_\_\_ (body part).
- 4.11 Apply knowledge of relational anatomy for each essential projection of the \_\_\_\_\_ (body part).
- 4.12 Demonstrate proper positioning for essential projections of the \_\_\_\_\_ (body part) in a simulated laboratory experience.
- 4.13 Demonstrate radiation protection (ALARA) during simulated laboratory experiences. (Collimation, lead protection, technical factors)
- 4.14 Name and identify image evaluation criteria for essential projections of the \_\_\_\_\_ (body part) using a radiograph.
- 4.15 Identify errors on x- rays of the essential projections of the \_\_\_\_\_ (body part) and list corrective actions required.

4.16 Perform x-ray examinations of essential and non-essential projections of the \_\_\_\_\_ (body part) using all/some of the components of a radiographic exam in a simulated lab experience.

#### **Module 5 – (1 week) Upper/Lower Extremities – Adaptive**

##### **Mapped same as module 2**

5.1 List the essential projections for the \_\_\_\_\_ (body part).

5.2 List proper (technical and positioning) parameters (IR size, SID, CR, collimation, marker location, kvp, breathing instructions, grid, body and part position, other) to obtain an optimal image for essential projections of the \_\_\_\_\_ (body part)

5.3 Describe the image evaluation criteria for essential projections of the \_\_\_\_\_ (body part).

5.4 Compare and contrast essential projections of the \_\_\_\_\_ (body part).

5.5 Identify essential projections of the \_\_\_\_\_ (body part) using a radiograph.

5.6 Recognize and correct common positioning errors of the essential projections of the \_\_\_\_\_ (body part).

5.7 Recognize and describe patient conditions (ie. acuity and habitus, etc.) that will require adaptation to the essential projections of the \_\_\_\_\_ (body part) to obtain an optimal image. (positioning and technical)

5.8 Perform adaptations to the essential projections of the \_\_\_\_\_ (body part) in a simulated laboratory experience.

5.9 Describe and perform workflow (including pre and post procedural care) for the essential exams of the \_\_\_\_\_ body part.

5.10 Name and identify relevant anatomical landmarks for the essential projections of the \_\_\_\_\_ (body part).

5.11 Apply knowledge of relational anatomy for each essential projection of the \_\_\_\_\_ (body part).

5.12 Demonstrate proper positioning for essential projections of the \_\_\_\_\_ (body part) in a simulated laboratory experience.

5.13 Demonstrate radiation protection (ALARA) during simulated laboratory experiences. (Collimation, lead protection, technical factors)

5.14 Name and identify image evaluation criteria for essential projections of the \_\_\_\_\_ (body part) using a radiograph.

5.15 Identify errors on x- rays of the essential projections of the \_\_\_\_\_ (body part) and list corrective actions required.

5.16 Perform x-ray examinations of essential and non-essential projections of the \_\_\_\_\_ (body part) using all/some of the components of a radiographic exam in a simulated lab experience.

#### **Module 6 – (1 week) Shoulder/Pelvis/hip – Adaptive**

##### **Mapped same as module 2**

6.1 List the essential projections for the \_\_\_\_\_ (body part).

6.2 List proper (technical and positioning) parameters (IR size, SID, CR, collimation, marker location, kvp, breathing instructions, grid, body and part position, other) to obtain an optimal image for essential projections of the \_\_\_\_\_ (body part)

6.3 Describe the image evaluation criteria for essential projections of the \_\_\_\_\_ (body part).

6.4 Compare and contrast essential projections of the \_\_\_\_\_ (body part).

6.5 Identify essential projections of the \_\_\_\_\_ (body part) using a radiograph.

6.6 Recognize and correct common positioning errors of the essential projections of the \_\_\_\_\_ (body part).

6.7 Recognize and describe patient conditions (ie. acuity and habitus, etc.) that will require adaptation to the essential projections of the \_\_\_\_\_ (body part) to obtain an optimal image. (positioning and technical)

6.8 Perform adaptations to the essential projections of the \_\_\_\_\_ (body part) in a simulated laboratory experience.

6.9 Describe and perform workflow (including pre and post procedural care) for the essential exams of the \_\_\_\_\_ body part.

6.10 Name and identify relevant anatomical landmarks for the essential projections of the \_\_\_\_\_ (body part).

6.11 Apply knowledge of relational anatomy for each essential projection of the \_\_\_\_\_ (body part).

6.12 Demonstrate proper positioning for essential projections of the \_\_\_\_\_ (body part) in a simulated laboratory experience.

6.13 Demonstrate radiation protection (ALARA) during simulated laboratory experiences. (Collimation, lead protection, technical factors)

6.14 Name and identify image evaluation criteria for essential projections of the \_\_\_\_\_ (body part) using a radiograph.

6.15 Identify errors on x-rays of the essential projections of the \_\_\_\_\_ (body part) and list corrective actions required.

6.16 Perform x-ray examinations of essential and non-essential projections of the \_\_\_\_\_ (body part) using all/some of the components of a radiographic exam in a simulated lab experience.

### **Module 7 – (1 week) Spine, Skull – Adaptive**

#### **Mapped same as module 2**

7.1 List the essential projections for the \_\_\_\_\_ (body part).

7.2 List proper (technical and positioning) parameters (IR size, SID, CR, collimation, marker location, kvp, breathing instructions, grid, body and part position, other) to obtain an optimal image for essential projections of the \_\_\_\_\_ (body part)

7.3 Describe the image evaluation criteria for essential projections of the \_\_\_\_\_ (body part).

7.4 Compare and contrast essential projections of the \_\_\_\_\_ (body part).

7.5 Identify essential projections of the \_\_\_\_\_ (body part) using a radiograph.

7.6 Recognize and correct common positioning errors of the essential projections of the \_\_\_\_\_ (body part).

7.7 Recognize and describe patient conditions (ie. acuity and habitus, etc.) that will require adaptation to the essential projections of the \_\_\_\_\_ (body part) to obtain an optimal image. (positioning and technical)

7.8 Perform adaptations to the essential projections of the \_\_\_\_\_ (body part) in a simulated laboratory experience.

7.9 Describe and perform workflow (including pre and post procedural care) for the essential exams of the \_\_\_\_\_ body part.

7.10 Name and identify relevant anatomical landmarks for the essential projections of the \_\_\_\_\_ (body part).

7.11 Apply knowledge of relational anatomy for each essential projection of the \_\_\_\_\_ (body part).

7.12 Demonstrate proper positioning for essential projections of the \_\_\_\_\_ (body part) in a simulated laboratory experience.

7.13 Demonstrate radiation protection (ALARA) during simulated laboratory experiences. (Collimation, lead protection, technical factors)

7.14 Name and identify image evaluation criteria for essential projections of the \_\_\_\_\_ (body part) using a radiograph.

7.15 Identify errors on x-rays of the essential projections of the \_\_\_\_\_ (body part) and list corrective actions required.

7.16 Perform x-ray examinations of essential and non-essential projections of the \_\_\_\_\_ (body part) using all/some of the components of a radiographic exam in a simulated lab experience.

### **Module 8 – (2 weeks) Fluoroscopy/UGI/Biliary Tract**

8.1 List the essential projections for the \_\_\_\_\_ (system). ie. Upper gastrointestinal system and biliary system (esophagogram, UGI, MBS, ERCP, cholangiography) **RTR.3.3**

8.2 List proper (technical and positioning) parameters (IR size, SID, CR, collimation, marker location, kvp, breathing instructions, grid, body and part position, other) to obtain an optimal image for essential projections of the \_\_\_\_\_ (essential exams) ie. esophagogram, UGI, MBS, ERCP, cholangiography **RTR.3.3, RTR.4.4**

8.3 Describe the image evaluation criteria for essential projections of the \_\_\_\_\_ (essential exam). **RTR.6.1, RTR.6.3, RTR.6.5, RTR.6.6, RTR.6.7, RTR.6.8**

- 8.4 Compare and contrast essential projections of the \_\_\_\_\_ (essential exam).
- 8.5 Identify essential projections of the \_\_\_\_\_ (essential exam) using a radiograph.
- 8.6 Recognize and correct common positioning errors of the essential projections of the \_\_\_\_\_ (essential exam). **RTR.6.8**
- 8.7 Recognize and describe patient conditions (ie. acuity and habitus, etc.) that will require adaptation to the essential projections of the \_\_\_\_\_ (essential exam) to obtain an optimal image. (positioning and technical) **RTR.4.5, 4.3.5, 5.3.1**
- 8.8 Perform adaptations to the essential projections of the \_\_\_\_\_ (essential exam) in a simulated laboratory experience. **4.3.2, 4.1.3, RTR.2.2, RTR.2.3, RTR.4.3, RTR.4.4, RTR.4.6, RTR.6.8**
- 8.9 Describe and perform workflow (including pre and post procedural care) for the essential exams of the Upper gastrointestinal and biliary tracts system (esophagogram, UGI, MBS, ERCP, cholangiography). **2.1.6, 2.2.4, 2.2.5, 3.1.5, 4.1.1, 4.2.1, 4.2.2, 4.2.3, 4.5.3, RTR.2.5, RTR.4.2, RTR.6.9**
- 8.10 Name and Identify relevant anatomical landmarks for the essential projections of the \_\_\_\_\_ (essential exam). **RTR.4.3**
- 8.11 Apply knowledge of relational anatomy for each essential projection of the \_\_\_\_\_ (essential exam). **RTR.4.3**
- 8.12 Demonstrate proper positioning for essential projections of the \_\_\_\_\_ (essential exam) in a simulated laboratory experience.
- 8.13 Demonstrate radiation protection (ALARA) during simulated laboratory experiences. (Collimation, lead protection, technical factors). **RTR.1.1, RTR.1.3, RTR.1.5, RTR.1.7**
- 8.14 Name and identify image evaluation criteria for essential projections of the \_\_\_\_\_ (essential exam) using a radiograph.
- 8.15 Identify errors on x- rays of the essential projections of the \_\_\_\_\_ (essential exam) and list corrective actions required.
- 8.16 Perform x-ray examinations of essential and non-essential projections of the \_\_\_\_\_ (essential exam) using all/some of the components of a radiographic exam in a simulated lab experience.
- 8.17 List personnel needed for upper gastrointestinal and biliary tract exams.
- 8.18 Name, explain, identify and use relevant equipment/supplies needed for upper gastrointestinal and biliary tract exams. **RTR.5.2, RTR.5.3, RTR.5.4, RTR.5.5, RTR.5.6, RTR.5.7, RTR.5.8**

### Upper Gastrointestinal System

Define and describe fluoroscopy.

Compare and contrast fluoroscopy to other imaging modalities.  
Describe, list and identify anatomy of GI tract.  
Compare and contrast body habitus in relation to structure location.  
Define Contrast– purpose, types and contraindications.  
Compare and contrast differing contrast agents used within the imaging department. ie. barium vs iodine based  
Explain and demonstrate pre and post instructions for the upper gastrointestinal system exams.  
Explain and demonstrate routine projections and pre/post instructions for esophagogram, UGI, MBS in simulation lab.  
List SID, IR, body position, part position, tube alignment, CR, structures included, collimation, marker placement, radiation protection, technical factors, patient instructions for upper gastrointestinal exams.  
Identify patient body position using radiographs with contrast agent.  
Compare and contrast workflow for upper gastrointestinal exams.  
Compare and contrast contraindications for upper gastrointestinal exams.  
Compare and contrast clinical indications for upper gastrointestinal exams.  
Compare and contrast adaptations for pediatric and geriatric populations

### Biliary Tract

Describe, list and identify anatomy of biliary tract.  
Define bile and describe function and gall bladder relationship to pertinent anatomy.  
List and describe the bile route.  
Define biliary terms.  
Explain biliary duct procedures (cholangiography and ERCP).  
Identify clinical indications for biliary duct procedures (cholangiography and ERCP).  
Explain and demonstrate routine projections for the biliary tract.  
Perform projections and pre/post instructions in simulation lab.  
Explain and perform workflow for biliary tract exams.  
Compare and contrast adaptations for pediatric and geriatric populations.

### Module 9 – (1 week) LGI

#### [Mapped same as module 8](#)

- 9.1 List the essential projections for the \_\_\_\_\_ (system). ie. Lower gastrointestinal system (SBFT, Barium enema, defecogram)
- 9.2 List proper (technical and positioning) parameters (IR size, SID, CR, collimation, marker location, kvp, breathing instructions, grid, body and part position, other) to obtain an optimal image for essential projections of the \_\_\_\_\_ (essential exams) ie. SBFT, Barium enema **RTR.3.3**
- 9.3 Describe the image evaluation criteria for essential projections of the \_\_\_\_\_ (essential exam).
- 9.4 Compare and contrast essential projections of the \_\_\_\_\_ (essential exam).
- 9.5 Identify essential projections of the \_\_\_\_\_ (essential exam) using a radiograph.
- 9.6 Recognize and correct common positioning errors of the essential projections of the \_\_\_\_\_ (essential exam).
- 9.7 Recognize and describe patient conditions (ie. acuity and habitus, etc.) that will require adaptation to the essential projections of the \_\_\_\_\_ (essential exam) to obtain an optimal image. (positioning and technical)



- 9.8 Perform adaptations to the essential projections of the \_\_\_\_\_ (essential exam) in a simulated laboratory experience.
- 9.9 Describe and perform workflow (including pre and post procedural care) for the essential exams of the Lower gastrointestinal system (SBFT, Barium enema, defecogram). **RTR.5.9**
- 9.10 Name and Identify relevant anatomical landmarks for the essential projections of the \_\_\_\_\_ (essential exam).
- 9.11 Apply knowledge of relational anatomy for each essential projection of the \_\_\_\_\_ (essential exam).
- 9.12 Demonstrate proper positioning for essential projections of the \_\_\_\_\_ (essential exam) in a simulated laboratory experience.
- 9.13 Demonstrate radiation protection (ALARA) during simulated laboratory experiences. (Collimation, lead protection, technical factors).
- 9.14 Name and identify image evaluation criteria for essential projections of the \_\_\_\_\_ (essential exam) using a radiograph.
- 9.15 Identify errors on x- rays of the essential projections of the \_\_\_\_\_ (essential exam) and list corrective actions required.
- 9.16 Perform x-ray examinations of essential and non-essential projections of the \_\_\_\_\_ (essential exam) using all/some of the components of a radiographic exam in a simulated lab experience.
- 9.17 List personnel needed for lower gastrointestinal exams.
- 9.18 Name, explain, identify and use relevant equipment/supplies needed for lower gastrointestinal exams.

### Lower Gastrointestinal System

- Describe, list and identify anatomy of lower GI tract.
- Compare and contrast body habitus in relation to structure location.
- Define Contrast– purpose, types and contraindications.
- Compare and contrast differing contrast agents used within the imaging department. I.e. barium vs iodine based
- Explain and demonstrate pre and post instructions for the lower gastrointestinal system exams.
- Explain and demonstrate routine projections and pre/post instructions for SBFT, Barium enema, defecogram in the simulation lab.
- List SID, IR, body position, part position, tube alignment, CR, structures included, collimation, marker placement, radiation protection, technical factors, patient instructions for lower gastrointestinal exams.
- List, identify and use equipment needed for lower gastrointestinal exams.
- Identify patient body position using radiographs with contrast agent.
- Compare and contrast workflow for lower gastrointestinal exams.
- Compare and contrast contraindications for lower gastrointestinal exams.
- Compare and contrast clinical indications for lower gastrointestinal exams.
- Compare and contrast adaptations for pediatric and geriatric populations
- Compare and contrast lower gastrointestinal exams with upper gastrointestinal exams.

## **Module 10 – (1 week) Urinary/Venipuncture**

### **Mapped same as module 8**

- 10.1 List the essential projections for the \_\_\_\_\_ (system). ie. IVU, retrograde urography/cystography/urethrography, voiding cysturethrography
- 10.2 List proper (technical and positioning) parameters (IR size, SID, CR, collimation, marker location, kvp, breathing instructions, grid, body and part position, other) to obtain an optimal image for essential projections of the \_\_\_\_\_ (essential exams) ie. IVU, retrograde urography/cystography/urethrography, voiding cysturethrography
- 10.3 Describe the image evaluation criteria for essential projections of the \_\_\_\_\_ (essential exam).
- 10.4 Compare and contrast essential projections of the \_\_\_\_\_ (essential exam).
- 10.5 Identify essential projections of the \_\_\_\_\_ (essential exam) using a radiograph.
- 10.6 Recognize and correct common positioning errors of the essential projections of the \_\_\_\_\_ (essential exam).
- 10.7 Recognize and describe patient conditions (ie. acuity and habitus, etc.) that will require adaptation to the essential projections of the \_\_\_\_\_ (essential exam) to obtain an optimal image. (positioning and technical)
- 10.8 Perform adaptations to the essential projections of the \_\_\_\_\_ (essential exam) in a simulated laboratory experience.
- 10.9 Describe and perform workflow for the essential exams (including pre and post procedural care) of the Urinary system. (IVU, retrograde urography/cystography/urethrography, voiding cysturethrography)
- 10.11 Name and Identify relevant anatomical landmarks for the essential projections of the \_\_\_\_\_ (essential exam).
- 10.12 Apply knowledge of relational anatomy for each essential projection of the \_\_\_\_\_ (essential exam).
- 10.13 Demonstrate proper positioning for essential projections of the \_\_\_\_\_ (essential exam) in a simulated laboratory experience.
- 10.14 Demonstrate radiation protection (ALARA) during simulated laboratory experiences. (Collimation, lead protection, technical factors).
- 10.15 Name and identify image evaluation criteria for essential projections of the \_\_\_\_\_ (essential exam) using a radiograph.
- 10.16 Identify errors on x- rays of the essential projections of the \_\_\_\_\_ (essential exam) and list corrective actions required.
- 10.17 Perform x-ray examinations of essential and non-essential projections of the \_\_\_\_\_ (essential exam) using all/some of the components of a radiographic exam in a simulated lab experience.

10.18 List personnel needed for Urinary exams.

10.11 Name, explain, identify and use relevant equipment/supplies needed for Urinary exams.

### Urinary System and Venipuncture:

List types of Urinary exams.

Identify and describe anatomy of Urinary system.

Identify and describe kidney location and orientation.

List functions of the urinary system.

List points of constriction in the urinary system and identify on images.

Define venipuncture.

Define contrast media– technologist responsibilities, purpose, types, reactions and contraindications.

Explain and demonstrate pre and post instructions for the urinary system exams. (include patient prep)

Explain and demonstrate routine projections for the urinary system.

Identify and list equipment needed for urinary system exams.

Perform these projections and pre/post instructions in simulation lab.

List SID, IR, body position, part position, tube alignment, CR, structures included, collimation, marker placement, radiation protection, technical factors, patient instructions for urinary system exams.

List evaluation criteria for urinary system projections.

Identify radiographic images for urinary projections.

Define common pathologies as indicated by CAMRT competency profile.

Compare and contrast workflow for urinary system exams.

Compare and contrast contraindications for urinary system exams.

Compare and contrast clinical indications for urinary system exams.

Compare and contrast adaptations for pediatric and geriatric populations.

### **Module 11 – (1 week) Operating Room, Angiography, Interventional, diagnostic Therapeutic Modalities**

#### **Mapped same as module 8**

11.1 List the projections for procedures for the special imaging area procedure. ie. operating room, angiography, interventional, and diagnostic therapeutic modalities (ie mammography)

11.2 List proper (technical and positioning) parameters (IR size, SID, CR, collimation, marker location, kvp, breathing instructions, grid, body and part position, other) to obtain an optimal image for essential projections of the special imaging area procedure. ie. operating room, angiography, interventional, and diagnostic therapeutic modalities (ie mammography)

11.3 Describe the image evaluation criteria for projections of the \_\_\_\_\_ (special imaging area).

11.4 Compare and contrast projections of the \_\_\_\_\_ (special imaging area).

11.5 Identify projections of the \_\_\_\_\_ (special imaging area) using a radiograph.

11.6 Recognize and correct common positioning errors of the projections of the \_\_\_\_\_ (special imaging area).

11.7 Recognize and describe patient conditions (ie. acuity and habitus, etc.) that will require adaptation to the projections of the \_\_\_\_\_ (special imaging area) to obtain an optimal image. (positioning and technical)

11.8 Perform adaptations to the projections of the \_\_\_\_\_ (special imaging area) in a simulated laboratory experience.

11.9 Describe and perform workflow (including pre and post procedural care) for the special imaging area procedures. ie. operating room, angiography, interventional, and diagnostic therapeutic modalities (ie mammography) **RTR.4.7**

11.10 Name and Identify relevant anatomical landmarks for the projections of the \_\_\_\_\_ (special procedure).

11.11 Apply knowledge of relational anatomy for each projection of the \_\_\_\_\_ (special procedure).

11.12 Demonstrate proper positioning for projections of the \_\_\_\_\_ (special procedure) in a simulated laboratory experience.

11.13 Demonstrate radiation protection (ALARA) during simulated laboratory experiences. (Collimation, lead protection, technical factors).

11.14 Name and identify image evaluation criteria for projections of the \_\_\_\_\_ (special procedure) using a radiograph.

11.15 Identify errors on x- rays of projections of the \_\_\_\_\_ (special procedure) and list corrective actions required.

11.16 Perform x-ray examinations of projections of the \_\_\_\_\_ (special procedure) using all/some of the components of a radiographic exam in a simulated lab experience.

11.17 List personnel needed for each special imaging area.

11.18 Name, explain, identify and use relevant equipment/supplies needed for special imaging area.

## **Module 12- (1 week) Special Radiographic Procedures and Review**

### **[Mapped same as module 8](#)**

12.1 List the projections for the special procedure. ie. Arthrography, Biliary duct procedures, hysterosalpingography, Myelography, Orthoroentgenography, and conventional tomography

12.2 List proper (technical and positioning) parameters (IR size, SID, CR, collimation, marker location, kvp, breathing instructions, grid, body and part position, other) to obtain an optimal image for essential projections of the special procedure. ie. . Arthrography, Biliary duct procedures, hysterosalpingography, Myelography, Orthoroentgenography, and conventional tomography

12.3 Describe the image evaluation criteria for projections of the \_\_\_\_\_ (special procedure).

12.4 Compare and contrast projections of the \_\_\_\_\_ (special procedure).

12.5 Identify projections of the \_\_\_\_\_ (special procedure) using a radiograph.

12.6 Recognize and correct common positioning errors of the projections of the \_\_\_\_\_ (special procedure).

12.7 Recognize and describe patient conditions (ie. acuity and habitus, etc.) that will require adaptation to the projections of the \_\_\_\_\_ (special procedure) to obtain an optimal image. (positioning and technical)

12.8 Perform adaptations to the projections of the \_\_\_\_\_ (special procedure) in a simulated laboratory experience.

12.9 Describe and perform workflow (including pre and post procedural care) for the special procedures. Ie. Arthrography, Biliary duct procedures, hysterosalpingography, Myelography, Orthoroentgenography, and conventional tomography

12.10 Name and Identify relevant anatomical landmarks for the projections of the \_\_\_\_\_ (special procedure).

12.11 Apply knowledge of relational anatomy for each projection of the \_\_\_\_\_ (special procedure).

12.12 Demonstrate proper positioning for projections of the \_\_\_\_\_ (special procedure) in a simulated laboratory experience.

12.13 Demonstrate radiation protection (ALARA) during simulated laboratory experiences. (Collimation, lead protection, technical factors).

12.14 Name and identify image evaluation criteria for projections of the \_\_\_\_\_ (special procedure) using a radiograph.

12.15 Identify errors on x- rays of projections of the \_\_\_\_\_ (special procedure) and list corrective actions required.

12.16 Perform x-ray examinations of projections of the \_\_\_\_\_ (special procedure) using all/some of the components of a radiographic exam in a simulated lab experience.

12.17 List personnel needed for each special procedure.

12.18 Name, explain, identify and use relevant equipment/supplies needed for special procedures. **RTR.5.10**

### Special Procedures

Define, explain and demonstrate special procedures. (Arthrography, joint injections, biliary duct, HSG, Myelography, Orthoroentgenography, conventional tomography.

Discuss SID, IR, body position, part position, tube alignment, CR, structures included, collimation, marker placement, radiation protection, technical factors, patient instructions for special radiographic procedures.

Explain and demonstrate pre and post instructions for special radiographic exams. (include patient prep)

Identify and list equipment needed for special radiographic exams.

List and explain evaluation criteria for special radiographic exam projections.

Identify radiographic images for special radiographic exam projections.

Define common pathologies as indicated by CAMRT competency profile.

Compare and contrast workflow for special radiographic exam projections.

Compare and contrast contraindications for special radiographic exam projections.

Compare and contrast clinical indications for special radiographic exam projections.

Compare and contrast adaptations for pediatric and geriatric populations.

## REQUIRED MATERIALS & RECOMMENDED PREPARATION / INFORMATION

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### Required Textbooks:

Bontrager, K.L., & Lampignano, J.P. (2021). *Textbook of Radiographic Positioning and Related Anatomy (10<sup>th</sup> ed.)*. St. Louis, Missouri: Elsevier Mosby.

McQuillen Martensen, K. (2020). *Radiographic Image Analysis (5<sup>th</sup> ed.)*. St. Louis, Missouri: Elsevier Saunders.

Bontrager, K.L., Lampignano, J.P., & Kendrick, L.E. (2021). *Workbook: Textbook of Radiographic Positioning and Related Anatomy (10<sup>th</sup> ed.)*. St. Louis, Missouri: Elsevier Mosby.

Bontrager, K.L., & Lampignano, J.P. (2021). *Bontrager's Handbook of Radiographic Positioning and Techniques (10<sup>th</sup> ed.)*. St. Louis, Missouri: Elsevier Mosby.

### Optional Textbooks:

Fauber, T. (2021). *Radiographic Imaging & Exposure (6<sup>th</sup> ed.)*. Elsevier Health Sciences.

Bushong, S.C. (2017). *Radiologic Science for Technologists: Physics, Biology, and Protection (11th ed.)*. Elsevier Health Sciences.

Carroll, Q.B., & Bowman, D.(2014). *Adaptive Radiography with Trauma, Image Critique and Critical Thinking*. Delmar, Cengage Learning.

### Desire-to-Learn (D2L):

D2L – the Camosun College online learning portal contains the remainder of the learning materials for this course. Students are expected to familiarize themselves with the online learning environment and all the features it has to make this course experience enriching. Log on at <https://online.camosun.ca/> to access these materials.

Additional resources may include, but are not limited to: lecture notes, PowerPoint slides, Laboratory Manuals, and hyperlinks. You may prefer to download lectures notes ahead of time (when available) and then write your notes directly onto copies of the slides. YouTube and other media services will also be used throughout the course via public domains.

D2L materials **must not** be considered your sole source of information. They merely summarize the main points and provide direction for your learning experiences. You may need to write down additional information in each lecture. Additionally, not all details can be covered in a lecture, and you will be required to refer to textbook material that is not discussed specifically in class.

### Other Materials:

Additional resources may include, but are not limited to: PDF's, lecture notes, PowerPoint slides, Textbook Companion Workbooks, Laboratory Manuals, and hyperlinks. You may prefer to download lectures notes ahead of time (when available) and then write your notes directly onto copies of the slides.

## COURSE SCHEDULE, TOPICS, AND ASSOCIATED PREPARATION / ACTIVITY / EVALUATION

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The following schedule and course components are subject to change with reasonable advance notice, as deemed appropriate by the instructor.

Week	Dates	Module	Lecture *Critique has a separate lecture that supplements Positioning lecture/labs	Lab	Quizzes and Assignments
1	May 1-5	1	Course Introduction	See D2L for details	See D2L for details
2	May 8-12	2	Mandible and Special Facial Bones		
3	May 15-19	3	Adaptive Radiography Intro, Adapting Technique, and EI		
4	May 22-26 Victoria Day	4	Adaptive: Chest/Bony Thorax/Abdomen		
5	May 29-June 2	5	Adaptive: Upper/Lower		
6	June 5-9	6	Adaptive: Shoulder/Pelvis/Hip		
7	June 12-16 Graduation	7	Adaptive: Spine/Skull		
8	June 19-23		Catch up on Reading/Assignments		
9	June 26-30	8	Fluoroscopy/UGI		
10	July 3-7 Canada Day	8	UGI/Biliary		
11	July 10-14	9	LGI		
12	July 17-21	10	Urinary/Venipuncture		
13	July 24-28	11	OR/Angio/IV/Diagnostic and Therapeutic Modalities		
14	July 31-Aug 4	12	Special Radiographic Procedures/Review		
15	Aug 7-11 B.C. day	<b>EXAM WEEK</b>			

**\*\*Refer to D2L page for specific details for assignments and Critique portion of course.**

Exam Period is scheduled by registrar - check CAMLINK.

Specifics will be updated in D2L when known.

**Do not book trips until the final exam schedule is posted by the registrar.**

Students registered with the Centre for Accessible Learning (CAL) who complete quizzes, tests, and exams with academic accommodations have booking procedures and deadlines with CAL where advanced noticed is required. Deadlines can be reviewed on the [CAL exams page](http://camosun.ca/services/accessible-learning/exams.html). <http://camosun.ca/services/accessible-learning/exams.html>

## STUDENT EVALUATION

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DESCRIPTION	WEIGHTING
Quizzes	25
Comps	25
Critique	10
Assignments	10
C-arm and Radiography Portfolio Requirements Checklist (mandatory-must be done safely/efficiently)	Complete
Final Exam	30
<p><b>Students must achieve a minimum of 65% to use this course as a prerequisite and complete the C-arm and Radiography Portfolio Requirements Checklist.</b></p>	<p style="text-align: center;"><b>TOTAL</b></p> <p style="text-align: center;">100%</p>

If you have a concern about a grade you have received for an evaluation, please come and see me as soon as possible. Refer to the [Grade Review and Appeals](http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf) policy for more information.

25

## COURSE GUIDELINES & EXPECTATIONS

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See Course page on D2L.

## SCHOOL OR DEPARTMENTAL INFORMATION

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Health & Human Services Student Handbook: <http://camosun.ca/learn/school/health-human-services/student-info/index.html>

General Practicum Information: <http://camosun.ca/learn/school/health-human-services/student-info/practicum-info.html>

Allied Health & Technologies Department Handbooks:

- Certified Medical Laboratory Assistant: <http://camosun.ca/learn/school/health-human-services/student-info/program-info/cmla.html>
- Diagnostic Medical Sonography: <http://camosun.ca/learn/school/health-human-services/student-info/program-info/sono.html>
- Medical Radiography: <http://camosun.ca/learn/school/health-human-services/student-info/program-info/mrad.html>

Students enrolled in Allied Health & Technologies Programs must achieve a minimum of 65% or a “COM” in each of their courses in order to use their course as a pre-requisite and progress in their program.

Students enrolled in Allied Health & Technologies Programs must participate in learning activities that include intimate and direct personal contact with their classmates during supervised practice. Students are training to perform the duties of a healthcare professional. These duties usually require constant, close physical contact with patients and clients. Students may be required to simulate and perform these activities on one another



during this course. Students may also be required to use special hygiene practices and protective gear to protect themselves from the transmission of communicable diseases (like COVID-19). Risks associated with learning and performing the physical duties of a healthcare profession cannot be entirely eliminated by any amount of caution or protection. Students who refuse, or are incapable of participating and performing these activities due to personal or medical limitations, may only continue to participate in their course work when supported by officially registered accommodations or temporary medical advisory.

## STUDENT RESPONSIBILITY

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Enrolment at Camosun assumes that the student will become a responsible member of the College community. As such, each student will display a positive work ethic, assist in the preservation of College property, and assume responsibility for their education by researching academic requirements and policies; demonstrating courtesy and respect toward others; and respecting expectations concerning attendance, assignments, deadlines, and appointments.

## SUPPORTS AND SERVICES FOR STUDENTS

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Camosun College offers a number of services to help you succeed in and out of the classroom. For a detailed overview of the supports and services visit <http://camosun.ca/students/>.

Support Service	Website
Academic Advising	<a href="http://camosun.ca/advising">http://camosun.ca/advising</a>
Accessible Learning	<a href="http://camosun.ca/accessible-learning">http://camosun.ca/accessible-learning</a>
Counselling	<a href="http://camosun.ca/counselling">http://camosun.ca/counselling</a>
Career Services	<a href="http://camosun.ca/coop">http://camosun.ca/coop</a>
Financial Aid and Awards	<a href="http://camosun.ca/financialaid">http://camosun.ca/financialaid</a>
Help Centres (Math/English/Science)	<a href="http://camosun.ca/help-centres">http://camosun.ca/help-centres</a>
Indigenous Student Support	<a href="http://camosun.ca/indigenous">http://camosun.ca/indigenous</a>
International Student Support	<a href="http://camosun.ca/international/">http://camosun.ca/international/</a>
Learning Skills	<a href="http://camosun.ca/learningskills">http://camosun.ca/learningskills</a>
Library	<a href="http://camosun.ca/services/library/">http://camosun.ca/services/library/</a>
Office of Student Support	<a href="http://camosun.ca/oss">http://camosun.ca/oss</a>
Ombudsperson	<a href="http://camosun.ca/ombuds">http://camosun.ca/ombuds</a>
Registration	<a href="http://camosun.ca/registration">http://camosun.ca/registration</a>
Technology Support	<a href="http://camosun.ca/its">http://camosun.ca/its</a>
Writing Centre	<a href="http://camosun.ca/writing-centre">http://camosun.ca/writing-centre</a>

If you have a mental health concern, please contact Counselling to arrange an appointment as soon as possible. Counselling sessions are available at both campuses during business hours. If you need urgent support after-hours, please contact the Vancouver Island Crisis Line at 1-888-494-3888 or call 911.

## COLLEGE-WIDE POLICIES, PROCEDURES, REQUIREMENTS, AND STANDARDS

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### Academic Accommodations for Students with Disabilities

The College is committed to providing appropriate and reasonable academic accommodations to students with disabilities (i.e. physical, depression, learning, etc). If you have a disability, the [Centre for Accessible Learning](#) (CAL) can help you document your needs, and where disability-related barriers to access in your courses exist, create an accommodation plan. By making a plan through CAL, you can ensure you have the appropriate academic accommodations you need without disclosing your diagnosis or condition to course instructors. Please visit the CAL website for contacts and to learn how to get started:

<http://camosun.ca/services/accessible-learning/>

### Academic Integrity

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.13.pdf> for policy regarding academic expectations and details for addressing and resolving matters of academic misconduct.

### Academic Progress

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.1.pdf> for further details on how Camosun College monitors students' academic progress and what steps can be taken if a student is at risk of not meeting the College's academic progress standards.

### Course Withdrawals Policy

Please visit <http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.2.pdf> for further details about course withdrawals. For deadline for fees, course drop dates, and tuition refund, please visit <http://camosun.ca/learn/fees/#deadlines>.

### Grading Policy

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.5.pdf> for further details about grading.

### Grade Review and Appeals

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf> for policy relating to requests for review and appeal of grades.

### Mandatory Attendance for First Class Meeting of Each Course

Camosun College requires mandatory attendance for the first class meeting of each course. If you do not attend, and do not provide your instructor with a reasonable reason in advance, you will be removed from the course and the space offered to the next waitlisted student. For more information, please see the "Attendance" section under "Registration Policies and Procedures"

(<http://camosun.ca/learn/calendar/current/procedures.html>) and the Grading Policy at <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.5.pdf>.

### Medical / Compassionate Withdrawals

Students who are incapacitated and unable to complete or succeed in their studies by virtue of serious and demonstrated exceptional circumstances may be eligible for a medical/compassionate withdrawal. Please visit <http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.8.pdf> to learn more about the process involved in a medical/compassionate withdrawal.

### Sexual Violence and Misconduct

Camosun is committed to creating a campus culture of safety, respect, and consent. Camosun's Office of Student Support is responsible for offering support to students impacted by sexual violence. Regardless of when or where the sexual violence or misconduct occurred, students can access support at Camosun. The Office of Student Support will make sure students have a safe and private place to talk and will help them understand what supports are available and their options for next steps. The Office of Student Support respects a student's right to choose what is right for them. For more information see Camosun's Sexualized Violence and Misconduct Policy: <http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.9.pdf> and [camosun.ca/sexual-violence](http://camosun.ca/sexual-violence). To contact the Office of Student Support: [oss@camosun.ca](mailto:oss@camosun.ca) or by phone: 250-370-3046 or 250-370-3841

### Student Misconduct (Non-Academic)

Camosun College is committed to building the academic competency of all students, seeks to empower students to become agents of their own learning, and promotes academic belonging for everyone. Camosun also expects that all students to conduct themselves in a manner that contributes to a positive, supportive, and safe learning environment. Please review Camosun College's Student Misconduct Policy at <http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.5.pdf> to understand the College's expectations of academic integrity and student behavioural conduct.

**Changes to this Syllabus:** Every effort has been made to ensure that information in this syllabus is accurate at the time of publication. The College reserves the right to change courses if it becomes necessary so that course content remains relevant. In such cases, the instructor will give the students clear and timely notice of the changes.