



BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY

Course Outline Part A

School of Health Sciences  
Program: Medical Radiography  
Option:

**MRAD 2206**  
**Radiographic Procedures 2**

<b>Hours/Week:</b> 10.45	<b>Total Hours:</b> 115	<b>Term/Level:</b> 2
<b>Lecture:</b>	<b>Total Weeks:</b> 11	<b>Credits:</b> 7.5
<b>Lab:</b>		
<b>Other:</b>		

**Prerequisites**

**MRAD 2206 is a Prerequisite for:**

Course No.	Course Name
MRAD 1106	Radiographic Procedures

Course No.	Course Name
MRAD 3306	Radiographic Procedures

**Course Goals**

To provide students with the skills required to:

1. position patients for the views/projections being studied.
2. understand the differences between various radiographic contrast media and their possible reactions.
3. understand radiographic considerations for the geriatric, pediatric and trauma patient.
4. understand various tomographic applications.
5. evaluate the diagnostic and technical acceptability of radiographs of areas being studied.
6. formulate technique charts and recognize variables of techniques for various exams and the variations of the normal patient.

**Course Description**

Positioning for radiographic procedures related to the urinary, digestive and biliary systems as well as, thoracic cage, hip and shoulder girdle radiography will be covered. Skills to evaluate the diagnostic and technical acceptability of the radiographs for the respective areas will also be examined. Methods for formulating technique charts for various exams and for the variations of the normal patient will be developed. Trauma, geriatric and pediatric considerations, contrast media and tomography for the various procedures will be discussed. Labs will reinforce theoretical components of the course.

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### Evaluation

Final Examination	40%	All labs and projects must be satisfactorily completed before a course mark will be given.  (60% is required for a pass.)
Midterm	30%	
Quizzes	15%	
Assignment	10%	
Laboratory	5%	
TOTAL	<u>100%</u>	

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### Course Outcomes and Sub-Outcomes

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

1. Define, describe and demonstrate beam directions, centering points and patient positioning relating to the radiography of the:
  - vertebral column
  - urinary system
  - GI system
  - biliary system
  - hip and acetabulum
  - shoulder girdle
  - thoracic cage
2. Describe patient preparation, required projections and contrast media relating to radiographic examinations of the urinary, digestive and biliary systems.
3. Describe contrast reactions of various contrast media and the pertinent treatment.
4. Describe pediatric and geriatric considerations and immobilization for various radiographic procedures.
5. Describe tomographic considerations for various anatomical structures.
6. Describe and role play trauma scenarios.
7. Demonstrate radiographic judgement, organizational and communication skills and radiographic competence while positioning a patient.
8. Evaluate radiographs for the studied areas for diagnostic acceptability based on:
  - a. inclusion of all required structures
  - b. demonstration of correct positioning
  - c. appropriate level of density demonstrated

**Course Outcomes and Sub-Outcomes (cont'd.)**

9. Assess main contributing factors to the overall radiographic image quality based on the:
  - a. type of patient involved (body habitus, pathology, limitation of movement)
  - b. appropriate technique factors required
  - c. acceptable processing methods used
10. Propose possible solutions to poor radiographic quality.
11. Develop radiographic technique charts using the DuPont Bit System.
12. Outline technique chart adjustments to *be made with respect to*:
  - a. patient body habitus
  - b. patient pathology
  - c. patient age
  - d. specific equipment used (generators, film screen, grids, etc.)

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**Course Record**

Developed by: Shirley Hunkvik, RT, MEd Date: \_\_\_\_\_  
Instructor Name and Department (signature)

Revised by: Dori Kaplun, ACR, MEd Date: July, 1997  
Instructor Name and Department (signature)

Approved by: Shirley Hundvik, RT, MEd Start Date: September, 1998  
Associate Dean / Program Head (signature)



BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY

Course Outline Part B

School of Health Sciences

Program: Medical Radiography

Option:

**MRAD 2206**  
**Radiographic Procedures 2**

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**Effective Date**

September, 1998/9

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**Instructor(s)**

~~Dori Kaplan, ACR, MEd~~

RITA HOLAGUUN ACR MA

Office No.: SW3 4084

Office Hrs.: As posted

Phone: 432-8743

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**Text(s) and Equipment**

Required:

1. Radiographic Procedure 2 notes and lab manual.
2. "Merrill's Atlas of Radiographic Positions and Radiologic Procedures" Phillip W. Ballinger — 8th Edition. Volumes 1 and 2.
3. Curriculum Guide for Radiography Programs — CAMRT.

Recommended:

1. "Skeletal Anatomy" — Bryon.
2. "Joy of Sectioning" — Dowdell.
3. "The Contrast Media Manual" — Katzberg.
4. "Textbook of Radiographic Positioning and Related Anatomy" — Bontrager.
5. "Trauma and Mobile Radiography" — Drafke.

## Creating a technique chart

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Each group will create a technique chart for the human body based on a pail of water. The procedure will be as follows:

- using a plastic pail filled with water to a specific level of 20 cm (approximately the same measurement as an average abdomen), produce a radiograph that has a background density of 1.0.
- based on this technique, produce an abdomen radiograph in the supine position.
- based on the Dupont Bit system and the AP abdomen radiograph, create a technique chart for the human body for the areas of:
  - vertebra
  - shoulder girdle
  - thoracic cage
  - chest
  - pelvis/hip
  - abdomen
  - plus any other additional areas except skull and extremities.

Each group will create a technique chart for extremities based on an initial radiograph taken of a wrist and ankle.

Each group will compare and analyze the difference of extremity techniques between the created techniques and actual hospital techniques.

# Radiographic Reevaluation quizzes

Room 4060

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There will be a Rad Eval quiz each week in the film critique labs (Room 4060). In addition to ensuring comprehension of material, the objective of these quizzes are to encourage peer coaching and to promote confidence in your abilities. These are desirable skills in the workplace.

Persons participating in the Rad Eval quiz will be randomly selected each week. **The topic will be from the area studied the previous week.** Persons not selected for the weekly quiz may be asked to prepare an oral presentation.

In term 2A, the quizzes will be done with partners. The procedure will be as follows:

- During the lab, you will be given 5 minutes to critique a radiograph using the 10 point radiographic evaluation technique and form.
- When you have finished critiquing your radiograph, a partner will be assigned to review the critique.
- Discuss the critique with your partner. You may choose to change the critique after the discussion, prior to handing in the Rad Eval form.
- The final decision on what is presented on the radiographic evaluation form rests with the originating partner.

In term 2B, quizzes will be done on an individual basis.

The lab will be done with an assigned partner. Partners and room assignments will be randomly selected on a weekly basis.

Assume that you are relieving another technologist for coffee. He/she has just developed the last film for a radiographic series on the patient on the table.

The following set-up will be used:

- machine/equipment will be on
- view/projection will be indicated on the radiographic evaluation form
- phantom will be on the table in the position that it was when the radiograph was taken
- technique that was used for the radiograph will be set on the control panel
- exposed cassette will be in position as it was exposed

You will evaluate the radiograph with your partner using the 10 point radiographic system.

Repeat the radiograph if not all criteria are met. Clinical notebooks may be used. **Only one repeat may be made.** While one person is developing the radiograph, the other person should shut the room down. Complete the 10 point radiographic evaluation for your repeat radiograph.

Students are responsible for ensuring rooms are left neat and tidy.

Radiographs and corresponding radeval sheets are to be handed in at the end of the lab.

Schedule for Lectures and Labs MRAD 2206

Week #	Dates	# of Lectures & Topics	Lab contents/format	Notes
1	Sept 6-10	T - Intro/course outline W - L Spine W - L Spine Th - Sacrum/Coccyx F - Sacrum/Coccyx	REORIENTATION Demo sensitometry in room groups. Show films, sensitize, process, visual check, mqm. List all 21 steps on flip chart <ul style="list-style-type: none"> <li>• Sensitometry curve to be completed and handed in for lab mark</li> <li>• Scavenger Hunt- to be completed and submitted for lab mark (refamiliarization with lab)</li> <li>• Radiography – Shoot thru Cervical Spine using overhead tube – phantom on stretcher</li> </ul> RAD EVAL LAB A/C orientation	Darkroom processing this week New lab partners No quiz Set A to join set C on Thursday morning (use 6 rooms) – 1 set A student from each room in assigned room as per room schedule
2	Sept 13-17	M - C Spine T - C Spine W - T Spine W - T Spine Th - Hip F - Hip	L SPINE & SACRUM/COCCYX Positioning- AP/Lat. and Obl. (ant & post) L spine & lat. spot of L5/S1. AP/Lateral Sacrum & Coccyx. Radiography - L spine scenario RAD EVAL LAB Spine - Lumbar, Sacrum & Coccyx. (no quiz)	Daylight Processing this week Assume ID & informed/IMPLIED consent completed. Instructors to check- <ul style="list-style-type: none"> <li>• Cassette use</li> <li>• Techniques preset</li> <li>• Marker use</li> <li>• Work organization</li> </ul>
3	Sept 20-24	M - Hip	CERVICAL & THORACIC SPINE	Darkroom processing week

Week #	Dates	# of Lectures & Topics	Lab contents/format	Notes
3	Sept 20-24	M - Hip T - Acetabulum/Ilium W - Shinerama W - Shinerama Th – Shoulder Girdle F – Shoulder Girdle	CERVICAL & THORACIC SPINE Positioning-AP, Dens, ant/post obl, Lateral C Spine and Lateral C/T (Practice upright and recumbent) AP/Lat. Thoracic Spine Radiography – 2 Cervical Spine scenarios RAD EVAL LAB C & T Spine (quiz – L Spine)	Darkroom processing week Instructors to check- <ul style="list-style-type: none"> <li>• Cassette use</li> <li>• Marker use (obliques)</li> <li>• Preset techniques</li> <li>• Organization</li> <li>• Breathing technique for lateral Thoracic Spine</li> <li>• Identification of Anode end of tube</li> </ul>
4	Sept 27-Oct 1	M – Shoulder Girdle T - Shoulder Girdle W – Technique Charts W – Technique Charts Th – Urinary System Introduction F - Urinary System	HIP Positioning - AP, Frogleg and Transfemoral Radiography – Axiolateral hip scenario. RAD EVAL LAB Hip (quiz C & T spine)	Daylight Processing New lab partners/rooms Instructors check- <ul style="list-style-type: none"> <li>• Cassettes</li> <li>• Marker placement</li> <li>• Techniques preset</li> <li>• Organization</li> </ul> Wrap discussion of hip organization

Week #	Dates	# of Lectures & Topics	Lab contents/format	Notes
5	Oct 4-8	M – Urinary System T – Urinary System W – Urinary Tomography W – Retrograde & cystos Th – Contrast Reactions F - Guest lecturer (Dr Harrison – Trauma)	SHOULDER Positioning – AP (ext rot), Obl. (int rot) Lateral Scapula, Axial, Westpoint shoulder. Radiography – Bumped Up Shoulder Radiography Scenario. RAD EVAL LAB Shoulder (quiz Hip)	Darkroom Processing Must have Spine, Hip, Shoulder entered in lab performance log sheet prior to going to clinical. Take TLDs if applicable Instructors check:- <ul style="list-style-type: none"> <li>• Use of filters</li> <li>• Organization</li> <li>• Marker placement</li> <li>• Preset techniques</li> </ul>
6	Oct 11-15 & Oct 18-22	M - Thanksgiving/GI Intro T – GI Intro W – Midterms A/B W – Midterms C/D Th - Colon F – Colon	URINARY SYSTEM Positioning – AP kidneys, Obl of one kidney, Obl of both kidneys, AP Bladder, Obl. Bladder Radiography – Tomography of Kidneys RAD EVAL LAB Urinary System (quiz Shoulder) APPLIED LAB Lumbar & Cervical Spine	Daylight Processing Pixies in Rooms 4 & 6 - all sets leave own room to take tomos. Practice informed/IMPLIED consent for IVP & tomos and patient prep check. Instructors check:- <ul style="list-style-type: none"> <li>• Cassettes</li> <li>• Marker placement</li> <li>• Techniques including tomos.</li> <li>• Organization</li> </ul> Wrap – demonstration of ureteric compression application and release.

Week #	Dates	# of Lectures & Topics	Lab contents/format	Notes
8	Nov 1-5 & Nov 15-19	M – Chest & Ribs T - Clavicle & AC Jts W - Clavicle & AC Jts W - Sternum & SC Jts Th – Sternum & SC Jts F - Pharynx, larynx	STOMACH, CHEST & RIBS Positioning – RAO, LPO & Rt Lateral Stomach. Lordotic & Decubitus Chest. Posterior & Anterior Obl. Ribs (Upper/lower) Radiography – Chest Radiography and Rib Radiography Scenarios RAD EVAL LAB Chest, Ribs, Clavicle and AC Joints (quiz Colon) APPLIED LAB Shoulder	Daylight Processing C-Arm Fluoro Unit set up in Room 7 with Pixie phantom on stretcher Instructors check <ul style="list-style-type: none"> <li>• Rib positioning for patient comfort (AP/PA Upright etc)</li> <li>• Organization – time patient is in position - lordotic view</li> <li>• Cassette size and orientation selection – body habitus (stomach) and area of interest (ribs)</li> <li>• Marker use (decubitus –chest obliques - stomach)</li> <li>• Technique selection (upper/lower ribs)</li> </ul>
9	Nov 22-26 & Nov 29-Dec 3	M - Biliary Intro, Oral chole T - OR Chole, T-Tube W - ERCP, PTC W - Tomography Th - Tomography F- Review	CLAVICLE, STERNUM & AC Jts Positioning-Axial Clavicle, AC jts with weights, RAO Sternum/SC jt & Lateral Sternum. Radiography-Clavicle Radiography and Sternum Radiography Scenarios RAD EVAL LAB Sternum, SC Jts & Soft Tissue Neck (quiz-Chest & Ribs) APPLIED LAB Sternum, SC jts & Clavicle	Darkroom Processing Instructors check <ul style="list-style-type: none"> <li>• SID for various parts</li> <li>• Technique change for AC jts out of bucky at 72”</li> <li>• Masking split cassette in bucky</li> </ul>

Week #	Dates	# of Lectures & Topics	Lab contents/format	Notes
7	Oct 25-29 & Nov 8-12	M – Colon rad eval T - Colon W - UGI W - UGI Th - Chest/Remem Day F – Ribs	COLON Positioning – Post /Ant Obl Abdo, PA 35°↓ Rectosigmoid, HB Lateral Rectum & Lateral Decubitus Abdomen Radiography – Large Intestine Radiography Scenario RAD EVAL LAB GI System – Colon (quiz Urinary System) APPLIED LAB Hip	Darkroom Processing New lab partners/rooms Set B will miss this lab (Remembrance Day). Make up lab on Wed Nov 10 <sup>th</sup> from 1200 – 1430 – if unable to finish at this lab, double up with Set D on Friday afternoon for first two hours of positioning lab. (No Case Study labs this week). C-Arm Fluoro Unit set up in Room 7 with Pixie phantom on stretcher Instructors check:- <ul style="list-style-type: none"> <li>• Case preparation (cassettes, grids, markers, filters, sponges. cassette holder etc.)</li> <li>• Practice informed /implied consent</li> <li>• Organization</li> <li>• Preset techniques</li> <li>• Marker use (decub,obliques)</li> <li>• Filter use</li> </ul>