BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY

COURSE OUTLINE

COURSE NAME *Image Recording, Equipment and Quality Control 1*

COURSE NUMBER *MRAD 1102*

Prepared by *Ann McMillen*

School *Health Sciences*

Program *Medical Radiography*

Date Prepared *November 1995*

DATE *January 1996*

Taught to *Level 1* Year

School *Health Sciences*

Program *Medical Radiography*

Option

Term *Level 1* Hrs/Wk *3 lectures* Credits *3.0*

No. of Weeks *16* Total Hours *48*

Instructor(s) *Ann McMillen* Office *SW3-4086* Local *8743*

Office Hours *Open*

COURSE GOALS

To provide students with the knowledge needed to operate radiographic processing equipment and use accessory radiographic equipment to process and record radiographic images. In addition, students will apply the concepts of quality control (QC) to develop and implement a program for radiographic processing equipment.

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

1. identify the major components of radiographic, fluoroscopic and tomographic equipment.
2. identify and explain accessory equipment for:
   a. patients, e.g., immobilization devices,
   b. radiographic, fluoroscopic and tomographic procedures, e.g., grids, filters, cones, etc.
3. explain the basic principles of the photographic process.
4. explain the conditions of operation for:
   a. darkroom, e.g. film storage, lighting,
   b. daylight equipment, e.g. loader and unloader.
5. recognize chemical hazards and apply corrective measures when appropriate.
6. describe the essential features of image recording materials such as x-ray film, intensifying screens, cassettes and imaging plate for digital radiography.
7. identify the elements of radiographic processing and describe the major components of automatic film processors and silver recovery equipment.
8. describe briefly each of the following: duplication and subtraction of radiographic images, image viewing equipment (construction and conditions).

9. describe common faults, causes and corrective measures of processing artifacts.
10. explain the principles of sensitometry.
11. discuss a QA framework for radiology and describe selected QC tests for processing, films, screens, cassettes, darkroom and accessory equipment.
12. explain how a reject analysis is done in the radiology department.

EVALUATION

Final Examination	40%	A grade of 60% is required to pass this course.
Mid-Term		
Projects		
Laboratory		
Other (1) Quiz	20%	
(2) Quiz	20%	
(3) Quiz	20%	

REQUIRED TEXT(S) AND EQUIPMENT

Bushong, S. Radiologic Science for Technologists. 5th Edition. Mosby-Year Book Inc. 1993.

REFERENCE TEXTS AND RECOMMENDED EQUIPMENT

- Cullinan, A. & J. Producing Quality Radiographs, 2nd Edition, J.B. Lippincott Co. 1994.
- Currey, T. et al., Chistensen's Introduction to the Physics of Diagnostic Radiology, 4th Edition, 1990.
- Carlton, R. & A., Principles of Radiographic Imaging, an Art and a Science.
- Gray, J., et al. Quality Control in Diagnostic Imaging, Aspen Publishers Inc., 1983.
- Carroll, Q., Fuchs's Radiographic Exposure, Processing and Quality Control, 1993

COURSE SUMMARY

This course will explore the fundamentals of radiographic image recording and processing, as well as introduce the basic concepts of processor quality control. Specifically, the following topics will be covered: accessory equipment, the photographic process, recording material, processing, silver recovery, sensitometry, presentation of the image, duplication and subtraction of images, processing artifacts, processor quality control and reject analysis.

COURSE OUTLINE
(continued)

Week Lecture or Lab Number	Material Covered	References
	Part A — Image Recording Introduction to imaging schemes in radiology ▸ Radiographic ▸ Fluoroscopic ▸ Tomographic	
	Accessory equipment ▸ filters ▸ collimators ▸ grids ▸ film/screens ▸ immobilizing devices ▸ processors	
	Fundamentals of the Photographic Process ▸ emulsion ▸ latent image	
	Recording Material ▸ film ▸ intensifying screens ▸ cassettes	
	Processing Area ▸ darkroom ▸ daylignt processing	
	Automatic Processing ▸ chemistry ▸ equipment	
	Silver Recovery ▸ purpose ▸ methods	
	Sensitometry ▸ terms ▸ characteristic curves	

Week Lecture or Lab Number	Material Covered	References
	Presentation of the Image ▸ illuminators ▸ subtraction ▸ duplication	
	Artifacts ▸ types ▸ material and processor faults	
	Part B — Quality Control: Part I Hospital/Department QA Programs Equipment QC Programs Accessories for Patient Safety Processing Films/Screens/Cassettes Darkroom and Accessory Equipment Reject Analysis	