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 1996*

DATE *January 1997*

Taught to *Level 1* Year

School *Health Sciences*

Program *Medical Radiography*

Option

Term *Level 1* Hrs/Wk *2 lectures 2 labs* 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	50%	A grade of 60% is required to pass this course.
Mid-Term		
Projects		
Laboratory		
Other (1) Quiz	25%	
(2) Quiz	25%	

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	Lab
Jan. 6th 10th	Basic Radiographic System Components	Equipment Orientation
Jan. 13th 17th	Accessory Equipment • Filters, collimators, grids, processors, film, screens, cassettes, immobilization devices	Processor Orientation
Jan. 20th 24th	The Photographic Process	Grids
Jan. 27th 31st	Recording Material • Film • Screens • Cassettes	Compensating Filters
Feb. 3rd 7th	**Quiz #1** Review	Screens
Feb. 10th 14th	Automatic Exposure Control Processing Area	Grid Ratio
Feb. 17th 21st	Automatic Processing • Chemistry • Equipment • Silver recovery	mA/mAs and Density
Feb. 24th 28th	Basic Tomography Systems	KV-penetration, Density
Mar. 3rd 7th	Image Presentation • Duplication • Subtraction • Illuminators	Tomography, Subtraction & Duplication Angled beam
Mar. 17th 21st	Sensitometry	Angled beam Tomography, Subtraction & Duplication
Mar. 24th 28th	**Quiz #2** Review	Sensitometry
Mar. 31st Apr. 4th	Artifacts	KV-contrast
Apr. 7th 11th	Quality Control • Hospital/Department QA (Easter) • Equipment QC	Distance

COURSE OUTLINE
(continued)

Week	Lecture	Lab
Apr. 14th 18th	Quality Control (Easter) • Accessories • Processing • Films/Screens/Cassettes • Darkroom • Reject Analysis	Negative Processing
Apr. 21st	**FINAL EXAM WEEK**	