CAMOSUN COLLEGE	***School of Health & Human Services*** Medical Radiography Technology **Course Name: Radiographic Sciences 2 W2014** **Course Number: MRAD 243**

COURSE OUTLINE

The Approved Course Description is available on the web: http://camosun.ca/learn/calendar/current/web/mrad.html

Please note:

- *This outline will be electronically stored for five (5) years only. It is strongly recommended students keep this outline for their records.*
- *This course is only open to students in the Medical Radiography program.*

Introduction:

This course is divided into **two parts**.

Part A will commence by reviewing film based radiographic concepts, and then we will move on to explore the structure and function of specialized x-ray tubes including recent innovations in x-ray tube technology. From here, we will discuss digital imaging concepts and processes in depth while we cover the areas of digital: fluoroscopy, flat-panel radiography, mammography, and tomo-synthesis. We complete Part A with a discussion of Picture Archiving and Communication Systems (PACS), including the goals of Integrating the Healthcare Enterprise (IHE).

Part B will describe the concepts of Total Quality Management (TQM), Continuous Quality Improvement (CQI) and the Elements of Quality Assurance (QA) and Quality Control (QC) in Radiology. In particular, QC tests will be discussed for film-screen systems, digital imaging systems including digital radiography, fluoroscopy, mammography, and bone mineral densitometry systems, with particular reference to Safety Code 35. We close with a discussion of the future directions for medical imaging.

Prerequisites: A minimum of "C+" in MRAD 102, MRAD 230

Students must achieve a minimum of a C+ (65%) to use this course as a prerequisite.

1. Instructor Information

(a)	Instructor:	Brent Mekelburg B.Sc. RT (R)(MR)
(b)	Office Hours:	Wed, Thurs. 1230 – 1330 or by appointment
(c)	Location:	WT212D
(d)	Phone:	250-370 - 3992
(e)	Email:	mekelburgb@camosun.ca
(f)	Website:	http://online.camosun.ca/

2. Intended Learning Outcomes/Competencies

Letters and numbers following certain learning outcomes indicate the specific competencies covered from the CAMRT Medical Radiography Competency Profile:

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

1. Describe the structure and function of specialized x-ray tubes. (E1.1, E1.2, E1.7, E1.8)

2. Outline the recent technical innovation in x-ray tube technology. (E1.1, E1.2, E1.7, E1.8)

3. Describe the essential elements of digital image processing as it relates to digital radiography. (E2.4)

4. Describe the major system characteristics of each of the following image acquisition technologies: mammographic imaging, digital mammography and breast tomosynthesis, flat-panel digital radiography, and digital fluoroscopy. (E1.1, E1.2, E1.4, E1.7, E1.8, E1.10,)

5. Explore the nature and technology of PACS, and describe the goals of IHE. (D1.1, E3.1, E3.2, E3.3, E3.4)

6. Outline the essential concepts of TQM and CQI, QA, and QC. (D1.1, D2.1, D2.2, D2.5, D2.6, D2.7, D2.8, D2.9)

7. Outline the elements and procedures of QC tests as described in SC 35, for each of the following: film-screen imaging systems, digital imaging systems, including computed radiography and digital flat-panel radiography, fluoroscopy and mammography. (D2.1,D2.2, D2.5, D2.6, D2.8, D2.9)

3. Learning Resources

Required Textbooks:

Seeram, Euclid. **Digital Radiography: An Introduction**, Current edition (Delmar).

Bushong, S.C. **Radiologic Science for Technologists***: Physics, Biology, and Protection* 10th ed. (Elsevier).

Optional Textbooks:

Carlton, Richard., Adler, Arlene. **Principles of Radiographic Imaging, 5th Edition**. (Delmar).

Carter, Christi., Veale, Beth. **Digital Radiography and PACS**, Second Edition (Elsevier).

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.

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: 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.

4. Student Evaluation

Quizzes	50 %
Cumulative Final Exam	30 %
Professionalism	20 %
TOTAL	**100 %**

In emergency circumstances, a student may arrange to write a final examination before or after the scheduled time if the student would otherwise be unable to complete the program or course. Exceptions due to emergency circumstances, such as unavoidable employment commitments, health problems, or unavoidable family crises, require the approval of the instructor. Holidays or scheduled flights are not considered to be emergencies. The student may be required to provide verification of the emergency circumstance. (Camosun Academic Policy http://camosun.ca/learn/calendar/current/pdf/academic-policies.pdf)

Quizzes are written in class via D2L and are **CLOSED BOOK**!

There are **NO midterm** exams for this course.

The final exam will be scheduled by the registrar and is a ***cumulative*** assay of the entire course.

In this course, there is a 20% mark for professionalism. Behaviors that contribute to this mark include, but are not limited to: attendance, punctuality, respect, accountability, communication, courtesy, responsibility, integrity, collegiality, and exercising sound judgment exemplary of an MRT.

Attendance

You are expected to attend all classes, and be on time. It is your responsibility to acquire all information given during a missed class, including notes, hand-outs, assignments, changed exam dates, etc. Missed exams or quizzes cannot be made up except in case of documented illness (doctor's note required).

In case of illness or other unavoidable cause of absence, the student must communicate as soon as possible with his/her instructor indicating the reason for the absence. Prolonged illness of three or more consecutive days must have a medical certificate sent to the department.

5. Course Content and Schedule: Tuesday 1230-1420 and Thursday 1330-1420

Note: This schedule is tentative and subject to change if deemed necessary by the instructor.

Week	Week of	Module	Quizzes
PART A			
1	Jan 7	Introduction to MRAD 243 1. Film/Screen Based Radiography	
2	Jan 14	2. X-ray Tube Innovations and Technology	**Quiz 1 Mod 1**
3	Jan 21	3. Digital Image Processing	**Quiz 2 Mod 2**
4	Jan 28	4. Digital Imaging Concepts	**Quiz 3 Mod 3**
5	Feb 4	4. Digital Imaging Concepts	**Quiz 4 Mod 4**
6	Feb 11	5. Flat Panel Digital Radiography	**FAMILY DAY** **NO CLASS FEB 13**
7	Feb 18	5. Flat Panel Digital Radiography	**Quiz 5 Mod 5**
8	Feb 25	6.Digital Fluoroscopy	
9	Mar 4	7.Digital Mammography (Bushong and Seeram)	**Quiz 6 Mod 6**
10	Mar 11	7. Digital Mammography (Carlton &Adler)	
11	Mar 18	7. Tomography	**Quiz 7 Mod 7**
12	Mar 25	8. PACS (Intro and Carlton & Adler)	
13	Apr 1	8. PACS (Seeram)	**Quiz 8 Mod 8**
PART B			
14	Apr 8	9.QA/QC Concepts	
15	Apr 15	9. Conventional Radiography QA/QC & LAB DEMO	**Quiz 9 Mod 9**
16	Apr 22	10. CR (Digital) QA/QC	**Quiz 10 Mod 10**
17	Apr 29	11. Fluoroscopy QA/QC	**Quiz 11 Mod 11**
18	May 6	12. Mammography QA/QC	**Quiz 12 Mod 12**
19	May 13	13. Future Developments in Medical Imaging	
20	May 20	**FINAL EXAM**	**Victoria Day**

Exam Period May 20-23 (scheduled by registrar) - check CAMLINK.

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

6. Grading System

Standard Grading System (GPA)

Percentage	Grade	Description	Grade Point Equivalency
90-100	A+		9
85-89	A		8
80-84	A-		7
77-79	B+		6
73-76	B		5
70-72	B-		4
65-69	C+	Minimum level of achievement to use the course as a prerequisite.	3
60-64	C		2
50-59	D	Minimum level of achievement for which credit is granted.	1
0-49	F	Minimum level has not been achieved.	0

Temporary Grades

Temporary grades are assigned for specific circumstances and will convert to a final grade according to the grading scheme being used in the course. See Grading Policy E-1.5 at **camosun.ca** for information on conversion to final grades, and for additional information on student record and transcript notations.

Temporary Grade	Description
I	*Incomplete*: A temporary grade assigned when the requirements of a course have not yet been completed due to hardship or extenuating circumstances, such as
IP	*In progress*: A temporary grade assigned for courses that, due to design may require a further enrollment in the same course. No more than two IP grades will be assigned for the same course. *(For these courses a final grade will be assigned to either the 3rd course attempt or*
CW	*Compulsory Withdrawal:* A temporary grade assigned by a Dean when an instructor, after documenting the prescriptive strategies applied and consulting with peers, deems that a student is unsafe to self or others and must be removed from the lab,

7. Recommended Materials or Services to Assist Students to Succeed Throughout the Course

CONDUCT POLICIES

It is the student's responsibility to become familiar with the content of these policies. The policies are available in each School Administration Office, Registration, and on the College web site in the Policy Section.

Academic Policies and Procedures
Student Conduct Policy

LEARNING SUPPORT AND SERVICES FOR STUDENTS

There are a variety of services available for students to assist them throughout their learning. This information is available in the College Calendar, Registrar's Office or the College web site at

http://www.camosun.bc.ca

MRT PROFESSIONAL CODE OF ETHICS

Camosun College Medical Radiography Technology students are expected to abide by the Canadian Association of Medical Radiation Technologist (CAMRT) Code of Ethics insomuch as it applies to them in the learning and clinical environments. This information is available on the CAMRT website at:

CAMRT Code of Ethics

MRT Department Policies & Procedures

Camosun College Medical Radiography Technology students are responsible for knowing all of the MRT Department Policies and must abide by them, including dress codes & lab safety procedures.

http://camosun.ca/learn/programs/mrt/handbook.pdf

8. GENERAL INFORMATION

Suggested Study Time/Study Habits

- Successful students will probably spend 4 – 6 hours outside of class per week studying the content for this course to achieve full marks.
- Map out a homework schedule; include time for reading and learning activities.
- It is valuable to review your notes within 24 hours following each class to help retain the information.
- Study groups are a highly effective way of learning for many students.

Desire-to-Learn (D2L):

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The Medical Radiography Technology program is committed to promoting competence, professionalism and integrity in our students and developing their core skills to succeed throughout their academic programs and in their careers. The purpose of Academic Honesty Guidelines is to provide clear expectations of appropriate academic conduct and to establish processes for discipline in appropriate circumstances. It is the student's responsibility to become familiar with the content and the consequences of academic dishonesty. Before you begin your assignments, review the Academic Policies on the Camosun College website: http://camosun.ca/learn/becoming/policies.html