



## Course Outline

A POLYTECHNIC INSTITUTION

School of Computing and Academic Studies

Program: Medical Radiography

Option:

**Phys 3385**  
**Physics: Medical Radiography 3**

**Start Date:** Jan 6, 2004

**End Date:** April 30, 2004

**Total Hours:** 30    **Total Weeks:** 15

**Term/Level:** 1    **Course Credits:** 2

**Hours/Week:** 2    **Lecture:** 1    **Lab:** 1

**Shop:**    **Seminar:**    **Other:**

### Prerequisites

**Course No.**    **Course Name**

Phys 2285    Physics: Medical Radiography 2

### Phys 3385 is a Prerequisite for:

**Course No.**    **Course Name**

### ■ Course Description (required)

Physics of Medical Radiography 3 emphasizes the application of physical phenomena in medical radiography. Topics include anode heat loading, quantum noise, computed radiography and digital radiography. The physics of such devices as CCD cameras, photostimulable phosphor plates and other x-ray detectors will be discussed.

### ■ Evaluation

Term Test	30%
Quizzes	10%
Laboratory Reports	25%
Final Exam	35%
<b>TOTAL</b>	<b>100%</b>

Comments: A mark of 60% is required to pass the course.

### ■ Course Learning Outcomes/Competencies

Upon successful completion, the student will be able to:

- define relevant physics terms with units,
- explain or discuss relevant physics concepts with defined terminology,
- draw and label diagrams for relevant applied physics topics,
- demonstrate conceptual understanding of physics by solving numerical, subjective and objective problems,
- explain the radiographic image formation process to a patient

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### Competency profile

This course provides a foundation of applied science for the Radiography program, and in the process, covers a portion of the following competencies:

- A2.6, A4.2, A4.10, A5.4, A5.6, A5.7, A5.8, A7.5, A7.7
- B1.5, B1.6, B1.7, B1.8, B2.1, B2.2, B2.3, B2.5, B3.2, B3.3, B4.1, B4.2, B5.1, B5.2, B5.3
- C2.4, C2.7
- D1.13, D1.14, D2.2, D3.1, D3.2

### ■ Verification

I verify that the content of this course outline is current.

J. Talman  
Authoring Instructor

Jan 5/04  
Date

I verify that this course outline has been reviewed.

M. Delpierre  
Program Head/Chief Instructor

Jan 5/04  
Date

I verify that this course outline complies with BCIT policy.

J. D'Spirito  
Dean/Associate Dean

Jan 5/04  
Date

Note: Should changes be required to the content of this course outline, students will be given reasonable notice.

## ■ Instructor(s)

Jennifer Talman, M.Sc.

Office Location: SW3-4096

Office Phone: 451-7151

Office Hrs.: TBA

E-mail Address: JTALMAN@BCIT.CA

## ■ Learning Resources

### *Required:*

Bushong, Stewart C., *Radiologic Science for Technologists: Physics, Biology and Protection*, sixth edition, Mosby, (1997).

A Manual of Experiments in Medical Radiography Technology

### *Recommended:*

Scientific calculator

## ■ Information for Students

**Passing Grade:** The passing grade in this course is 60%

**Assignments:** Late assignments, lab reports or projects will **not** be accepted for marking. Assignments must be done on an individual basis unless otherwise specified by the instructor.

**Makeup Tests, Exams or Quizzes:** There will be **no** makeup tests, exams or quizzes. If you miss a test, exam or quiz, you will receive zero marks. Exceptions may be made for **documented** medical reasons or extenuating circumstances. In such a case, it is the responsibility of the student to inform the instructor **immediately**.

**Ethics:** BCIT assumes that all students attending the Institute will follow a high standard of ethics. Incidents of cheating or plagiarism may, therefore, result in a grade of zero for the assignment, quiz, test, exam, or project for all parties involved and/or expulsion from the course.

**Attendance:** The attendance policy as outlined in the current BCIT Calendar will be enforced. Attendance will be taken at the beginning of each session. Students not present at that time will be recorded as absent.

**Illness:** A doctor's note is required for any illness causing you to miss assignments, quizzes, tests, projects, or exam. At the discretion of the instructor, you may complete the work missed or have the work prorated.

**Attempts:** Students must successfully complete a course within a maximum of three attempts at the course. Students with two attempts in a single course will be allowed to repeat the course only upon special written permission from the Associate Dean. Students who have not successfully completed a course within three attempts will not be eligible to graduate from the appropriate program.

**Course Outline Changes:** The material or schedule specified in this course outline may be changed by the instructor. If changes are required, they will be announced in class.



BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY

Program: Medical Radiography  
 Course Delivered by: Physics Department  
 School of Computing and Academic Studies

Schedule For:  
**PHYS 3385**  
 Physics: Medical Radiography 3

Dates	Topics	Reference /Reading
Jan 6, 13,20	<b>Anode Heat Loading</b> <ul style="list-style-type: none"> <li>Conduction, Convection and Radiation</li> <li>Maximum heat load</li> <li>Heat loss; fixed anode and rotating anode</li> <li>Maximum power input curve</li> <li>Anode heating and cooling curves</li> </ul>	Phys 2275 notes (Chap. 6) Bushong (Chap. 10)
Jan 27, Feb 3	<b>Image Noise</b> <ul style="list-style-type: none"> <li>quantum noise</li> <li>electronic noise</li> </ul>	
Feb 10, 17, 24  Midterm: Mar 2	<b>Digital Concepts</b> <ul style="list-style-type: none"> <li>Terminology</li> <li>Bits and bytes</li> <li>Binary numbers and number of grey levels</li> <li>Memory organization and size</li> <li>Data acquisition</li> <li>Analog to digital conversion</li> <li>PACS, DICOM, and JPEG</li> </ul>	Bushong (Chap. 28)
Mar 9, 23,30	<b>Computed Radiography</b> <ul style="list-style-type: none"> <li>Photostimulable phosphor plate</li> <li>Latent image</li> <li>Characteristic Curve</li> <li>Resolution</li> <li>Advantages and disadvantages</li> </ul>	Bushong (Chap. 28)
Apr 6, 12  Review: Apr 20	<b>Digital Radiography</b> <ul style="list-style-type: none"> <li>Direct and Indirect</li> <li>Direct to digital</li> <li>Scanned Projection Radiography</li> <li>Amorphous silicon flat panel detector</li> <li>CCD camera</li> </ul>	Bushong (Chap. 28)