



**MRAD 165 Physics of Medical Imaging and Radiation Therapy  
Summer 2019**

**COURSE OUTLINE**

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The course description is available on the web:  
<http://camosun.ca/learn/calendar/current/web/mrad.html#mrad165>

*Ω Please note: This outline will not be kept indefinitely. It is recommended students keep this outline for their records, especially to assist in transfer credit to post-secondary institutions.*

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**1. Instructor Information**

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|-------------------------|------------------------------|---------------------|
| <b>(a) Instructor</b>   | Stephanie LaForest           |                     |
| <b>(b) Office hours</b> | By Appointment.              |                     |
| <b>(c) Location</b>     | F346C                        |                     |
| <b>(d) Phone</b>        | 250-370-3513                 | <b>Alternative:</b> |
| <b>(e) E-mail</b>       | LaforestS@camosun.bc.ca      |                     |
| <b>(f) Website</b>      | online.camosun.ca (D2L page) |                     |

**2. Course Description & Intended Learning Outcomes**

In this intermediate level course, students examine the interactions of physical phenomena to understand the fundamental principles of radiation used for imaging and therapy. Students explore the differences between various imaging modalities such as sonography, conventional x-ray, computed tomography, nuclear imaging, and magnetic resonance imaging. Students experiment with theoretical knowledge during laboratory activities and examine the practical applications of medical imaging physics through classroom presentations.

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

- solve problems and perform calculations with relevant equations for matter, electricity, magnetism, radiation, and waves using the correct units, measures, and notations.
- explain and apply the fundamental principles of matter, electricity, magnetism, radiation, and waves as they pertain to medical imaging and radiation therapy.
- compare and contrast the appropriate use of radiographic imaging, nuclear imaging, magnetic resonance imaging, and sonographic imaging as determined by physical and biologic effects.
- describe the fundamental principles of radiation therapy as a treatment option for a variety of diseases.

### 3. Required Materials

**Required Textbook:**

MRAD 165 Course pack

**Optional Textbook:**

Bushong 10ed. Radiological Science for Technologists

**Other Materials:** Scientific Calculator (to be brought to every class).

### 4. Course Content and Schedule

**Lecture Days/Times & Room Number:**

Monday – Thursday: 8:30 – 9:20 AM, Fisher 316

**Lab & Tutorial Days/Times & Room Number:**

Friday: 8:30-10:20 AM, Fisher 316 (Lab /Tutorial/Test as announced)

### 5. Basis of Student Assessment (Weighting)

Assignments / Tutorials	20 %
Labs	10 %
Research Project	10 %
Midterms	30 %
Cumulative Final Exam	30 %
<b>TOTAL</b>	<b>100%</b>

#### Assessment Details

**Homework** will be assigned each week from the problems in the MRAD 165 Course pack. Homework for each week will be due at the beginning of class on Monday of the following week unless otherwise stated.

The Friday class period will alternate between labs and tutorials. The class will alternate between completing **experiments** and short **tutorial exercises or assignments**. You must be present in the lab to take your own data.

**Mid Term / Final Exam:** There will be two midterm exams. Problems on the midterms will be similar to those in the assignments and tutorials. The final exam will be cumulative, covering all content in the course and will take place in the final exam period.

The midterms will take place on Friday June 14<sup>th</sup> and Friday July 19<sup>th</sup> in the lab period.

#### Assessment Policies

Unless otherwise specified, labs and assignments will be due at the beginning of class on their respective due dates. Late labs/assignments will be subject to a 10 % per day late mark deduction, up to a maximum of 50%.

All outstanding course work must be submitted prior to the last day of classes.

Tests including the midterm and final exam must be written at the designated times.

Exceptions to the above policies will be made only in the case of exceptional circumstances such as illnesses or medical emergencies. Should such eventualities arise, please contact the instructor within 24 hours of the missed lab/test and obtain documentation.

## 6. Grading System

- Standard Grading System (GPA)
- Competency Based Grading System

## 7. Recommended Materials to Assist Students to Succeed Throughout the Course

Please feel welcome to email me to set up a time for extra help, or to stop by my office when I am available.

## 8. College Supports, Services and Policies

### Immediate, Urgent, or Emergency Support



If you or someone you know requires immediate, urgent, or emergency support (e.g., illness, injury, thoughts of suicide, sexual assault, etc.), **SEEK HELP**. Resource contacts:

<http://camosun.ca/about/mental-health/emergency.html> or  
<http://camosun.ca/services/sexual-violence/get-support.html#urgent>

### College Services

Camosun offers a variety of health and academic support services, including counselling, dental, centre for accessibility, help centre, learning skills, sexual violence support & education, library, and writing centre. For more information on each of these services, visit Student Services at <http://camosun.ca/services/>

### College Policies

Policies are available on the College website at <http://camosun.ca/about/policies/>

Camosun strives to provide clear, transparent, and easily accessible policies that exemplify the college's commitment to life-changing learning. It is the student's responsibility to become familiar with the content of College policies.

Education and academic policies include, but are not limited to, [Academic Progress](#), [Admission](#), [Course Withdrawals](#), [Student Appeals](#), Medical/Compassionate Withdrawal, Sexual Violence and Misconduct, Student Ancillary Fees, and Student Penalties and Fines.

### Student Conduct Policy

There is a [Student Conduct Policy](#). It is the student's responsibility to become familiar with the content of this policy. The policy is available in each School Administration Office, Registration, and on the College website.

## A. GRADING SYSTEMS

<http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.5.pdf#page=2>

The following two grading systems are used at Camosun College:

### 1. Standard Grading System (GPA)

Percentage	Grade	Description	Grade Point Equivalency
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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+		3
60-64	C		2
50-59	D		1
0-49	F	Minimum level has not been achieved.	0

## 2. Competency Based Grading System (Non GPA)

This grading system is based on satisfactory acquisition of defined skills or successful completion of the course learning outcomes.

Grade	Description
COM	The student has met the goals, criteria, or competencies established for this course practicum or field placement.
DST	The student has met and exceeded, above and beyond expectation, the goals, criteria, or competencies established for this course, practicum or field placement.
NC	The student has not met the goals, criteria or competencies established for this course, practicum or field placement.

## B. 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 at <http://www.camosun.bc.ca/policies/E-1.5.pdf#page=4> for information on conversion to final grades, and for additional information on student record and transcript notations.

Temporary Grade	Description
I	<i>Incomplete:</i> A temporary grade assigned when the requirements of a course have not yet been completed due to hardship or extenuating circumstances, such as illness or death in the family.
IP	<i>In progress:</i> A temporary grade assigned for courses that are designed to have an anticipated enrollment that extends beyond one term. No more than two IP grades will be assigned for the same course.
CW	<i>Compulsory Withdrawal:</i> 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, practicum, worksite, or field placement.