



UNIVERSITY OF CALGARY  
 FACULTY OF SCIENCE  
 DEPARTMENT OF PHYSICS & ASTRONOMY  
 COURSE OUTLINE

1. **Course:** MDPH 633 - Winter 2019

**Instructor:** Colleen Schinkel | [colleen.schinkel@ahs.ca](mailto:colleen.schinkel@ahs.ca) | 403-521-3332 | CCB 08 | by appointment

**(a) Course Description**

This course consists of 10 labs which will be completed by the student. These are selected to provide hands-on experience and instruction with key procedures encountered in the practice of medical physics. Students will become familiar with proper handling of clinical machines and equipment. The topics will also take the student from basic measurements of dosimetric quantities, through beam characterization, imaging and simulation, and the design of patient treatment plans based on those measurements, thus providing context to the material covered in the prerequisite courses.

**Course Site:** [d2l.ucalgary.ca](http://d2l.ucalgary.ca)

**Department of Physics & Astronomy:**

Office: Science B 605

Phone: 403 220-5385 Email: phasoffice@ucalgary.ca

**Note:**

Students must use their U of C account for all course correspondence.

2. **Requisites:** MDPH 623. MDPH 625 is a co-requisite.

3. **Grading:**

The University policy on grading and related matters is described in sections [F.1](#) and [F.2](#) of the online University Calendar. In determining the overall grade in the course the following weights will be used:

Lab assignments: pre-lab preparation and post-lab report (10 labs total) 10% each

Percentage to letter grade conversion scale:

> = 93 %	A +	> = 75 %	B +	> = 60 %	C +	> = 45 %	D +
> = 86 %	A	> = 70 %	B	> = 55 %	C	> = 40 %	D
> = 80 %	A -	> = 65 %	B -	> = 50 %	C -	< 40 %	F

Assignments are due on time as announced. Late assignments will be considered only in well-documented emergencies.

**LATE ASSIGNMENTS:**

Each of the above components will be given a letter grade using the official university grading system. The final grade will be calculated using the grade point equivalents weighted by the percentages given above and then converted to a final letter grade using the official university grade point equivalents.

This course has no scheduled final exam.

4. **Missed Components of Term Work:**

The regulations of the Faculty of Science pertaining to this matter are found in the Faculty of Science area of the Calendar in [Section 3.6](#). It is the student's responsibility to familiarize himself/herself/themself with these regulations.

See also [Section E.3](#) of the University Calendar.

#### 5. **Scheduled out-of-class activities:**

There are no scheduled out of class activities for this course.

#### 6. **Course Materials:**

Standard references will be available in the Medical Physics collection and will include:

- a. Khan = The Physics of Radiation Therapy, 3rd Ed. F.M. Khan.
- b. Metcalfe = The Physics of Radiotherapy X-rays from Linear Accelerators.
- c. Van Dyk Vol 1 = The Modern Technology of Radiation Oncology, red book
- d. Van Dyk Vol 2 = The Modern Technology of Radiation Oncology, yellow book
- e. Bushberg = The Essential Physics of Medical Imaging

Other references may be provided by the instructors for the individual lab topics.

7. **Examination Policy:** There are no formal examinations in this course. Marks are assigned strictly based on performance of the pre-lab assignments and post-lab reports. Students should also read the Calendar, [Section G](#), on Examinations.

#### 8. **Approved Mandatory and Optional Course Supplemental Fees:**

There are no mandatory or optional course supplemental fees for this course.

#### 9. **Writing across the Curriculum Statement:**

For all components of the course, in any written work, the quality of the student's writing (language, spelling, grammar, presentation etc.) can be a factor in the evaluation of the work. See also [Section E.2](#) of the University Calendar.

#### 10. **Human studies statement:**

Students will not participate as subjects or researchers in human studies.

See also [Section E.5](#) of the University Calendar.

#### 11. **Reappraisal of Grades:**

A student wishing a reappraisal, should first attempt to review the graded work with the Course coordinator/instructor or department offering the course. Students with sufficient academic grounds may request a reappraisal. Non-academic grounds are not relevant for grade reappraisals. Students should be aware that the grade being reappraised may be raised, lowered or remain the same. See [Section I.3](#) of the University Calendar.

1. **Term Work:** The student should present their rationale as effectively and as fully as possible to the Course coordinator/instructor within **15 days** of either being notified about the mark, or of the item's return to the class. If the student is not satisfied with the outcome, the student shall immediately submit the Reappraisal of Graded Term work form to the department in which the course is offered. The department will arrange for a reassessment of the work if, and only if, the student has sufficient academic grounds. See sections [1.1](#) and [1.2](#) of the University Calendar
2. **Final Exam:** The student shall submit the request to Enrolment Services. See [Section I.3](#) of the University Calendar.

#### 12. **OTHER IMPORTANT INFORMATION FOR STUDENTS:**

- a. **Mental Health** The University of Calgary recognizes the pivotal role that student mental health plays in physical health, social connectedness and academic success, and aspires to create a caring and supportive campus community where individuals can freely talk about mental health and receive supports when needed. We encourage you to explore the mental health resources available throughout the university community, such as counselling, self-help resources, peer support or skills-building available through the SU Wellness Centre (Room

370, MacEwan Student Centre, [Mental Health Services Website](#)) and the Campus Mental Health Strategy website ([Mental Health](#)).

- b. **SU Wellness Center:** The Students Union Wellness Centre provides health and wellness support for students including information and counselling on physical health, mental health and nutrition. For more information, see [www.ucalgary.ca/wellnesscentre](http://www.ucalgary.ca/wellnesscentre) or call [403-210-9355](tel:403-210-9355).
- c. **Sexual Violence:** The University of Calgary is committed to fostering a safe, productive learning environment. The Sexual Violence Policy (<https://www.ucalgary.ca/policies/files/policies/sexual-violence-policy.pdf>) is a fundamental element in creating and sustaining a safer campus environment for all community members. We understand that sexual violence can undermine students' academic success and we encourage students who have experienced some form of sexual misconduct to talk to someone about their experience, so they can get the support they need. The Sexual Violence Support Advocate, Carla Bertsch, can provide confidential support and information regarding sexual violence to all members of the university community. Carla can be reached by email ([svsa@ucalgary.ca](mailto:svsa@ucalgary.ca)) or phone at [403-220-2208](tel:403-220-2208).
- d. **Misconduct:** Academic misconduct (cheating, plagiarism, or any other form) is a very serious offence that will be dealt with rigorously in all cases. A single offence may lead to disciplinary probation or suspension or expulsion. The Faculty of Science follows a zero tolerance policy regarding dishonesty. Please read the sections of the University Calendar under [Section K](#). Student Misconduct to inform yourself of definitions, processes and penalties. Examples of academic misconduct may include: submitting or presenting work as if it were the student's own work when it is not; submitting or presenting work in one course which has also been submitted in another course without the instructor's permission; collaborating in whole or in part without prior agreement of the instructor; borrowing experimental values from others without the instructor's approval; falsification/ fabrication of experimental values in a report. **These are only examples.**
- e. **Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on [assembly points](#).
- f. **Academic Accommodation Policy:** Students needing an accommodation because of a disability or medical condition should contact Student Accessibility Services in accordance with the procedure for accommodations for students with disabilities available at [procedure-for-accommodations-for-students-with-disabilities.pdf](#).  
  
Students needing an accommodation in relation to their coursework or to fulfill requirements for a graduate degree, based on a protected ground other than disability, should communicate this need, preferably in writing, to the Associate Head, Graduate, of the Department of Physics & Astronomy, Dr. Jo-Anne Brown by email [jocat@ucalgary.ca](mailto:jocat@ucalgary.ca) or phone [403-220-8014](tel:403-220-8014). Religious accommodation requests relating to class, test or exam scheduling or absences must be submitted no later than **14 days** prior to the date in question. See [Section E.4](#) of the University Calendar.
- g. **Safewalk:** Campus Security will escort individuals day or night (See the [Campus Safewalk](#) website). Call [403220-5333](tel:403220-5333) for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.
- h. **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). Students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information, see [Legal Services](#) website.
- i. **Student Union Information:** [VP Academic](#), Phone: [403-220-3911](tel:403-220-3911) Email: [suvpaca@ucalgary.ca](mailto:suvpaca@ucalgary.ca). SU Faculty Rep., Phone: [403-220-3913](tel:403-220-3913) Email: [sciencerep@su.ucalgary.ca](mailto:sciencerep@su.ucalgary.ca). Student Ombudsman, Email: [suvpaca@ucalgary.ca](mailto:suvpaca@ucalgary.ca).
- j. **Internet and Electronic Device Information:** Unless instructed otherwise, cell phones should be turned off during class. All communication with other individuals via laptop, tablet, smart phone or other device is prohibited during class unless specifically permitted by the instructor. Students that violate this policy may be asked to leave the classroom. Repeated violations may result in a charge of misconduct.
- k. **Surveys:** At the University of Calgary, feedback through the Universal Student Ratings of Instruction ([USRI](#)) survey and the Faculty of Science Teaching Feedback form provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses. Your responses make a difference please participate in these surveys.

## Syllabus

### Course incomes:

#### (a) Course Learning Outcomes

By the end of the course, the student will:

- Understand the physics behind the steps in the radiotherapy cancer treatment process.
- Have gained hands-on experience in each of these steps through the use of TBCC radiotherapy equipment and treatment of our patient, 'Rando.'
- Will have knowledge to supplement what was learned in MDPH 623 and 625.
- Be introduced to tools they may need to use in their graduate projects.

#### (b) Course Learning Incomes

MDPH 623: Radiological Physics and Radiation Dosimetry is a prerequisite and MDPH 625: Radiation Oncology Physics is a co-requisite. Students are expected to already understand basics of measurement how to keep proper lab notes.

#### (c) Syllabus & Lab Schedule

Lab	Lecture Date	Topic
	Jan 8	Course intro, treatment overview and role of physics
1	Jan 15	Reference Dosimetry (TG-51 Photons)
2	Jan 22	Reference Dosimetry (TG-51 Electrons)
3	Jan 29	Beam Characteristics (Scanning)
4	Feb 5	Beam Modeling
	Feb 12	Pre-reading Week – no lab
	Feb 19	Reading Week – no lab
5	Feb 25	Simulation
6	Mar 5	Treatment Planning
7	Mar 12	Dosimeters
8	March 19	Patient Treatment, Setup, Verification
9	Mar 26	Orthovoltage
10	Apr 2	Brachytherapy
	Apr 9	Make-up week (if needed)

Department Approval:

Date: