

## General Course Information

### MDPH405

### Radiation Therapy

0.125 EFTS

Second Semester 19 Jul 2021 – 13 Nov 2021

### Course Coordinator

Bryn Currie

Location: By arrangement

Office hours: By appointment

Email: [bryn.currie@canterbury.ac.nz](mailto:bryn.currie@canterbury.ac.nz)

### Lectures

Monday	09:00-10:00	Psychology – Sociology 210
Monday	10:00-11:00	Psychology – Sociology 456
Tuesday	13:00-14:00	Jack Erskine 446

### Description

The purpose of this paper is to provide students with a general basic understanding of the practice and principles of radiotherapy physics, suitable as a background for entry into a training program in medical physics, in particular radiation oncology medical physics.

### Assessment

15%	Report
10%	Presentation
15%	Mid-term test
60%	Final exam

NB: a pass in the final exam is required to pass the course.

### Pre-requisites

Subject to the approval of the director of the programme.

## Textbooks

### *Required Textbooks:*

- S Dieterich et al., *Practical Radiation Oncology Physics*, Elsevier, 2016
- J. Van Dyk (Ed.), *The Modern Technology of Radiation Oncology: A Compendium for Medical Physicists and Radiation Oncologists*, Medical Physics Publishing, 1999

### *Recommended Reading:*

- F. M. Khan and J P Gibbons, *Khan's the Physics of Radiation Therapy*, 5<sup>th</sup> ed., Lippincott Williams and Wilkins, 2014
- E. B. Podgorsak (Ed.), *Radiation Oncology Physics: A Handbook for Teachers and Students*, IAEA, 2005

### *Additional Reading:*

- J. Van Dyk (Ed.), *The Modern Technology of Radiation Oncology, Volume 2: A Compendium for Medical Physicists and Radiation Oncologists*, Medical Physics Publishing, 2005
- J. Van Dyk (Ed.), *The Modern Technology of Radiation Oncology, Volume 3: A Compendium for Medical Physicists and Radiation Oncologists*, Medical Physics Publishing, 2013
- D Greene and P C Williams, *Linear Accelerators for Radiation Therapy*, 2<sup>nd</sup> ed., Taylor and Francis Group, 1997
- E Halperin, C Perez and L Brady (Eds.), *Perez and Brady's Principles and Practice of Radiation Oncology*, 5<sup>th</sup> ed., Lippincott Williams and Wilkins, 2008
- A Barrett et al., *Practical Radiotherapy Planning*, 4<sup>th</sup> ed., Hodder Arnold, 2009
- A Gerbaulet (Ed.) et al., *The GEC ESTRO Handbook of Brachytherapy*, ESTRO, 2002
- G Knoll, *Radiation Detection and Measurement*, 4<sup>th</sup> ed., John Wiley & Sons Ltd, 2010

## Learning Outcomes

On completion of this course, students should be able to:

- Describe the basic principles underlying radiotherapy methods
- Understand the principles of radiotherapy equipment
- Understand the characteristics of clinical beams and their measurements
- Describe and understand basic quality control procedures for equipment in radiotherapy
- Understand dosimetry measurements used in radiotherapy

- Understand basic treatment planning in radiotherapy
- Discuss a range of clinical applications

### **Summary of Course Content**

The general topics covered by this course are:

- Introduction to clinical radiation therapy
- History and development of radiation therapy
- Treatment machines – physical and clinical aspects
- Treatment machines – technical aspects
- Commissioning of radiotherapy equipment
- Phantoms used in radiotherapy
- Quality assurance
- Clinical dosimetry – photons and electrons
- Dosimetry protocols
- Instrumentation for dosimetry
- Primary standards and traceability for dosimetry
- Introduction to brachytherapy
- Treatment techniques in radiation therapy
- Treatment simulation
- Patient positioning
- Treatment planning

All important course information will be accessible through the UC *Learn* system available at <http://learn.canterbury.ac.nz/>. You need to login with your UC login and password and then select the course code on the left hand side. Make sure you check the *Learn* page regularly for relevant information and course updates. Note that all course related emails will be sent to your UC email address. No other email addresses will be accepted. It is your responsibility to check you UC email regularly.

### **Lecture timetable**

A detailed timetable will be available on *Learn*.

### **General Physics and Astronomy Information**

Please consult the document General Information for Physics and Astronomy Students on the Physics and Astronomy Web Page:

[https://apps.canterbury.ac.nz/1/science/phys-chem/PHYS%20-%20Course%20Outlines/2020\\_Course/General1\\_2020.PDF](https://apps.canterbury.ac.nz/1/science/phys-chem/PHYS%20-%20Course%20Outlines/2020_Course/General1_2020.PDF)