

General Course Information

MDPH403 Radiation Physics

0.125 EFTS

First Semester

17 February 2025 – 22 June 2025

Course Coordinator

Dr Konstantin Pavlov

Office location/hours: JVH726 / Mon 12-13 (excl. 24/02), Fri 11-12, additional meetings - by arrangement

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Lectures (check Timetable for possible changes)

Monday 11:00-12:00

Thursday 11:00-12:00

Friday 10:00-11:00

Description

The aim of the course is to provide participants with a general knowledge of the physical principles that form the foundations for the use of ionising radiation primarily in medicine (both therapy and diagnostic), and, to a lesser degree, in industry.

Assessment

10% Quiz 1

20% Mid-term test

10% Quiz 2

60% Final exam

Candidates may view their marked mid-term test scripts at the course coordinator office (Room 726, Julius von Haast Building).

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

The following shall apply for **all assessments in this course**, except where a lecturer has specifically stated otherwise **in written instructions for an assessment**.

Use Prohibited for Specified Reasons: Generative AI tools must not be used within this assessment due to specific considerations, which will be clearly communicated to students.

Generative AI Tools Cannot Be Used for This Assessment

Use Prohibited for Specified Reasons: Generative AI tools must not be used within this assessment due to specific considerations, which will be clearly communicated to students.

In this assessment, you are strictly prohibited from using generative artificial intelligence (AI) to generate any materials or content related to the assessment. This is because *students are expected to solve problems and demonstrate knowledge and understanding without the assistance of AI*. The use of AI-generated content is not permitted and may be considered a breach of academic integrity. Please ensure that all work submitted is the result of your own human knowledge, skills, and efforts.

Textbooks

Required Textbook:

- Podgorsak EB (2016), *Radiation Physics for Medical Physicists* 3rd ed, Springer (ebook)

Additional resources:

- Johns HE & Cunningham JR (1983, 1987), *The Physics of Radiology* 4th ed, Thomas (ebook)
- Podgorsak EB (Ed) (2005), *Radiation Oncology Physics: A Handbook for Teachers and Students*, IAEA (ebook)
- Khan FM (2014), *The Physics of Radiation Therapy* 5th ed, Lippincott Williams & Wilkins (ebook)
- Attix FH (1986), *Introduction to Radiological Physics and Radiation Dosimetry*, John Wiley & Sons (ebook)

Objectives

To provide a general understanding, and a basic knowledge of

- the types, origins and sources of ionising radiation and its interaction with matter
- the basics of ionising radiation dosimetry
- the principles involved in the detection and measurement of ionising radiation

Summary of Course Content

The topic areas covered are

- basic nuclear physics
- radioactivity
- charged ionising radiation
- uncharged ionising radiation
- neutrons
- dosimetric principles, quantities and units, and dosimetry in practice
- x-ray production

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 appropriate course code. 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 your UC email regularly.

General Physics and Astronomy Information

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

<https://apps.canterbury.ac.nz/1/science/phys-chem/PHYS%20-%20Course%20Outlines/General.PDF>

Below is an extract from the above-mentioned document:

“Dishonest Practice (online information [Academic Integrity :](https://www.canterbury.ac.nz/about-uc/what-we-do/teaching/academic-integrity) <https://www.canterbury.ac.nz/about-uc/what-we-do/teaching/academic-integrity>)

Plagiarism, collusion, copying and ghost writing are unacceptable and dishonest practices.

- Plagiarism is the presentation of any material (text, data, figures or drawings, on any medium including computer files) from any other source (including other students) without clear and adequate acknowledgement of the source. Note that the use of **AI generative tools such as ChatGPT** for assessment work is *strictly forbidden*, except where the lecturer concerned has specifically granted approval.
- Collusion is the presentation of work performed in conjunction with another person or persons, but submitted as if it has been completed only by the named author(s).
- Copying is the use of material (in any medium, including computer files) produced by another person(s) with or without their knowledge and approval.
- Ghost writing is the use of another person(s) (with or without payment) to prepare all or part of an item submitted for assessment.

Do not engage in dishonest practices. The School reserves the right to refer the [University Proctor](#) and where appropriate to **not mark the work or award a mark of zero.**”