

MRSC2560: Medical Radiation Science Instrumentation 2B

Callaghan

Semester 2 - 2023



THE UNIVERSITY OF
NEWCASTLE
AUSTRALIA

OVERVIEW

Course Description

This course discusses the principles and operation of equipment and techniques used in Medical Radiation Science.

The course presents to students the basic principles of operation for:

- Computed Tomography (CT) technology to produce medical images, and
- the Linear Accelerator and Brachytherapy techniques used in Radiation Therapy

The course provides practical information on radiation protection and safety. This course allows students to better understand, and provide a safe work environment, when using instrumentation associated with clinical practice.

Requisites

Successful completion of PHYS1250.

Students must be active in a Bachelor of Medical Radiation Science (Honours) program.

- Bachelor of Medical Radiation Science (Honours) (Diagnostic Radiography) [4002]
- Bachelor of Medical Radiation Science (Honours) (Radiation Therapy) [40010] or
- Bachelor of Medical Radiation Science (Honours) (Nuclear Medicine) [40011]

Assumed Knowledge MRSC2501: MRS Instrumentation 2A

Contact Hours

Callaghan Lecture

Face to Face on Campus
2 hour(s) per Week for 10 Weeks

Tutorial

Face to Face on Campus
2 hour(s) per Week for 8 Weeks

Laboratory

Face to Face on Campus
1 hour per Week for 3 Weeks

Unit Weighting 10

Workload

Students are required to spend on average 120-140 hours of effort (contact and non-contact) including assessments per 10-unit course.

COURSE OUTLINE

www.newcastle.edu.au

CRICOS Provider 00109J

CONTACTS

Course Coordinator	Callaghan John Tessier John.Tessier@newcastle.edu.au (02) 4921 6718 Consultation: Please email for an appointment
Teaching Staff	Other teaching staff will be advised on the course Canvas site.
School Office	School of Health Sciences Room 302, ICT Building Callaghan SchoolHealthSciences@newcastle.edu.au +61 2 4921 7053

SYLLABUS

Course Content	<ol style="list-style-type: none">1. Principles and operation of Computed Tomography (CT)2. Principles and operation of a Linear Accelerator (Linac)3. Brachytherapy4. Practical considerations for the safe operation of CT and Linac, including patient safety and radiation protection5. Quality assurance and record reporting processes for CT equipment
Course Learning Outcomes	<p>On successful completion of this course, students will be able to:</p> <ol style="list-style-type: none">1. Explain the principles of operation of CT, Linac and Brachytherapy2. Describe the quality assurance and record reporting processes required for safe and effective use of the CT, Linac and Brachytherapy3. Apply, participate in, and develop skills in CT procedures4. Describe basic CT terminology5. Discuss and describe the safety aspects of CT and Linac operation6. Discuss typical doses and dose reduction methods used in CT and Linac operation7. Explain common artefacts that can affect CT imaging
Course Materials	All course materials will be provided on the MRSC2560 Canvas site.

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ASSESSMENTS

This course has 3 assessments. Each assessment is described in more detail in the sections below.

	Assessment Name	Due Date	Involvement	Weighting	Learning Outcomes
1	Exam 1- during semester	Week 5- online quiz	Individual	20%	1,3,4,5&6
2	Exam 2- during semester	Week 10- online quiz	Individual	40%	1,2,3,4,5,6&7
3	Report	Monday October 2 nd by 6pm	Individual	40%	1,2,3,4,5,6&7

Late Submissions

The mark for an assessment item submitted after the designated time on the due date, without an approved extension of time, will be reduced by 10% of the possible maximum mark for that assessment item for each day or part day that the assessment item is late. Note: this applies equally to week and weekend days.

Assessment 1 – Exam 1

Assessment Type	In Term Test
Description	Online quiz on material from weeks 1-4
Weighting	20%
Due Date	Week 5 during timetabled lecture time (8am Thursday 17 th August)
Submission Method	Online through Canvas
Assessment Criteria	See MRSC2560 Canvas site
Return Method	Not returned
Feedback Provided	Group feedback via Canvas
Opportunity to Reattempt	Students WILL NOT be given the opportunity to reattempt this assessment.

Assessment 2 – Exam 2

Assessment Type	In Term Test
Description	Online quiz on material from weeks 1-9
Weighting	40%
Due Date	Week 9 during timetabled lecture time (8am Thursday 17 th August)
Submission Method	Online through Canvas
Assessment Criteria	See MRSC2560 Canvas site
Return Method	Not returned
Feedback Provided	Group feedback via Canvas
Opportunity to Reattempt	Students WILL NOT be given the opportunity to reattempt this assessment.

Assessment 3 - Report

Assessment Type	Report
Description	Students complete a written submission. Further information available on the MRSC2560 Canvas site
Weighting	40%
Due Date	Monday, October 2 nd
Submission Method	Turnitin
Assessment Criteria	See MRSC2560 Canvas site
Return Method	Online
Feedback Provided	Via Canvas
Opportunity to Reattempt	Students WILL NOT be given the opportunity to reattempt this assessment.

ADDITIONAL INFORMATION

Grading Scheme

This course is graded as follows:

Range of Marks	Grade	Description
85-100	High Distinction (HD)	Outstanding standard indicating comprehensive knowledge and understanding of the relevant materials; demonstration of an outstanding level of academic achievement; mastery of skills*; and achievement of all assessment objectives.
75-84	Distinction (D)	Excellent standard indicating a very high level of knowledge and understanding of the relevant materials; demonstration of a very high level of academic ability; sound development of skills*; and achievement of all assessment objectives.
65-74	Credit (C)	Good standard indicating a high level of knowledge and understanding of the relevant materials; demonstration of a high level of academic achievement; reasonable development of skills*; and achievement of all learning outcomes.
50-64	Pass (P)	Satisfactory standard indicating an adequate knowledge and understanding of the relevant materials; demonstration of an adequate level of academic achievement; satisfactory development of skills*; and achievement of all learning outcomes.
0-49	Fail (FF)	Failure to satisfactorily achieve learning outcomes. If all compulsory course components are not completed the mark will be zero. A fail grade may also be awarded following disciplinary action.

Communication Methods

Communication methods used in this course include:

- Face to face during lectures and tutorials
- Online through Canvas via announcements and email
- Through personal emails (using UON email address)

Course Evaluation

Each year feedback is sought from students and other stakeholders about the courses offered in the University for the purposes of identifying areas of excellence and potential improvement.

Oral Interviews (Vivas)

As part of the evaluation process of any assessment item in this course an oral examination (viva) may be conducted. The purpose of the oral examination is to verify the authorship of the material submitted in response to the assessment task. The oral examination will be conducted in accordance with the principles set out in the [Oral Examination \(viva\) Procedure](#). In cases where the oral examination reveals the assessment item may not be the student's own work the case will be dealt with under the [Student Conduct Rule](#).

Academic Misconduct

All students are required to meet the academic integrity standards of the University. These standards reinforce the importance of integrity and honesty in an academic environment. Academic Integrity policies apply to all students of the University in all modes of study and in all locations. For the Student Academic Integrity Policy, refer to <https://policies.newcastle.edu.au/document/view-current.php?id=35>.

The use of live-response ("homework helper") websites or applications during assessment items may be considered to be academic misconduct, and will be referred to the Student Academic Conduct Officer (SACO) under the University's [Student Conduct Rule](#).

The submission of generative AI chatbot (e.g. ChatGPT) products or materials, in whole or in part, and represented as a student's own original work, could be considered "dishonest or reckless conduct by a student to gain an advantage". This may be considered Academic Misconduct under the University's [Student Conduct Rule](#).

The use of websites or applications during assessment items ("Tabbing" or "Alt-Tabbing") may be considered to be academic misconduct, and will be referred to the Student Academic Conduct Officer (SACO) under the University's [Student Conduct Rule](#). In all cases, unless your Course Co-Ordinator has explicitly allowed a resource, then you must assume that a resource (text, website and/or application) is not to be used during an assessment item.

Academic Misconduct has the potential for serious consequences, including failing the course, or being suspended or excluded from the University.

Adverse Circumstances

The University acknowledges the right of students to seek consideration for the impact of allowable adverse circumstances that may affect their performance in assessment item(s). Applications for special consideration due to adverse circumstances will be made using the online Adverse Circumstances system where:

1. the assessment item is a major assessment item; or
2. the assessment item is a minor assessment item and the Course Co-ordinator has specified in the Course Outline that students may apply the online Adverse Circumstances system;
3. you are requesting a change of placement; or
4. the course has a compulsory attendance requirement.

Before applying you must refer to the Adverse Circumstance Affecting Assessment Items Procedure available at:

<https://policies.newcastle.edu.au/document/view-current.php?id=236>

Important Policy Information

The Help button in the Canvas Navigation menu contains helpful information for using the Learning Management System. Students should familiarise themselves with the policies and procedures at <https://www.newcastle.edu.au/current-students/no-room-for/policies-and-procedures> that support a safe and respectful environment at the University.

This course outline was approved by the Head of School. No alteration of this course outline is permitted without Head of School approval. If a change is approved, students will be notified and an amended course outline will be provided in the same manner as the original.

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