

## EPPREP 970: Physics for Medical Radiation and Health Sciences

Callaghan

Summer 2 - 2024



THE UNIVERSITY OF  
NEWCASTLE  
AUSTRALIA

*The Pathways and Academic Learning Support Centre recognises and respects the unique history and culture of Aboriginal and Torres Strait Islander peoples and their unbroken relationship with the lands and the waters of Australia over millennia. We are dedicated to reconciliation and to offering opportunities for Aboriginal and Torres Strait Islander peoples to access and succeed in higher education. The Centre is committed to providing a culturally safe and inclusive environment for all.*

## OVERVIEW

**Course Description** This preparation course will examine the basic principles of nuclear physics and how it applies to Medical Radiation and Health Sciences. Concepts such as the electromagnetic spectrum, sources and types of radiation, as well as how we quantify radiations effect on biological samples will be discussed. This course is recommended to students enrolled in MRSC1010 (and PHYS1250) but also students undertaking studies in the Health Sciences (Bachelor of Oral Health and Bachelor of Physiotherapy).

**Academic Progress Requirements** Nil

**Requisites** This course is only available to domestic students enrolled in NUPrep Bridging and Refresher [22223].

**Contact Hours**

**Lecture**  
Face to Face On Campus  
2 hour(s) per day for 5 day(s) starting Week 1

**Self-Directed Learning**  
Self-Directed  
1 hour(s) per day for 5 day(s) starting Week 1  
It is expected that you will spend at least one hour per day practicing skills and consolidating your learning.

**Tutorial**  
Face to Face On Campus  
1 hour(s) per day for 5 day(s) starting Week 1

**Unit Weighting** 5

**Workload** Students are required to spend on average 20 hours of effort (contact and non-contact) including assessments per 5 unit course.

# COURSE OUTLINE

# CONTACTS

<b>Course Coordinator</b>	<b>Dr Murray Sciffer</b> <a href="mailto:Murray.Sciffer@newcastle.edu.au">Murray.Sciffer@newcastle.edu.au</a> (02) 4921 5800 Consultation: Please email to schedule an appointment.	
<b>Teaching Staff</b>	Other teaching staff will be advised on the course Canvas site.	
<b>School Office</b>	<b>Callaghan</b> Ground Floor, General Purpose Building (GP) Ph: 02 4921 5558 <a href="mailto:enabling@newcastle.edu.au">enabling@newcastle.edu.au</a>	<b>Ourimbah</b> HO 168, Humanities Building Ph: 02 4348 4076 <a href="mailto:enabling@newcastle.edu.au">enabling@newcastle.edu.au</a>

# SYLLABUS

<b>Course Content</b>	The course covers: <ol style="list-style-type: none"><li>1. Units and measurement for the health sciences</li><li>2. Physics principles for MRS</li><li>3. Forms of energy</li><li>4. Fields and charged particles in fields and the detection of radioactive emissions</li><li>5. Nuclear physics and producing radiation</li><li>6. Biological effects of IR (Dosimetry)</li><li>7. Radiation Protection</li></ol>
<b>Course Learning Outcomes</b>	<b>On successful completion of this course, students will be able to:</b> <ol style="list-style-type: none"><li>1. Use appropriate units to solve basic physics principles e.g. Force, work, energy</li><li>2. Define and name different isotopes and unstable nuclides</li><li>3. Name the 3 types of radiation levels of penetration and detection of radioactive emissions.</li><li>4. Define radiopharmaceuticals</li><li>5. Explain the effect of ionising radiation on biological systems</li><li>6. Describe radiation doses using rad, Sievert</li><li>7. Give examples of serious early effects of high radiation doses</li></ol>
<b>Course Materials</b>	All course materials will be provided on the course Canvas site. Students are not required to purchase a textbook.

# ASSESSMENTS

This course has 5 assessments. Each assessment is described in more detail in the sections below.

	Assessment Name	Due Date	Involvement	Weighting	Learning Outcomes
1	Quiz 1	Sunday 18 <sup>th</sup> February 11.59 pm	Individual	20%	1, 2
2	Quiz 2	Sunday 18 <sup>th</sup> February 11.59 pm	Individual	20%	1, 2, 3
3	Quiz 3	Sunday 18 <sup>th</sup> February 11.59 pm	Individual	20%	1, 2, 3, 4
4	Quiz 4	Sunday 18 <sup>th</sup> February 11.59 pm	Individual	20%	1, 5, 6
5	Quiz 5	Sunday 18 <sup>th</sup> February 11.59 pm	Individual	20%	1, 5, 7

<b>Late Submissions</b>	Completion of each assessment item is necessary for a pass grade in this course. Extensions of time may be granted in consultation with your Course Coordinator.
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## Assessment 1 - Quiz 1

<b>Assessment Type</b>	Quiz
<b>Description</b>	Quiz based on content covered in Monday's lecture and tutorial. Quizzes can be attempted as many times as necessary (without penalty).
<b>Weighting</b>	20%
<b>Due Date</b>	Sunday 18 <sup>th</sup> February 11.59 pm
<b>Submission Method</b>	Online
<b>Assessment Criteria</b>	Correct answers
<b>Return Method</b>	Online
<b>Feedback Provided</b>	Feedback will be discussed the following day in class.

## Assessment 2 - Quiz 2

<b>Assessment Type</b>	Quiz
<b>Description</b>	Quiz based on content covered in Tuesday's lecture and tutorial. Quizzes can be attempted as many times as necessary (without penalty).
<b>Weighting</b>	20%
<b>Due Date</b>	Sunday 18 <sup>th</sup> February 11.59 pm
<b>Submission Method</b>	Online
<b>Assessment Criteria</b>	Correct answers
<b>Return Method</b>	Online
<b>Feedback Provided</b>	Feedback will be discussed the following day in class.

## Assessment 3 - Quiz 3

<b>Assessment Type</b>	Quiz
<b>Description</b>	Quiz based on content covered in Wednesday's lecture and tutorial. Quizzes can be attempted as many times as necessary (without penalty).
<b>Weighting</b>	20%
<b>Due Date</b>	Sunday 18 <sup>th</sup> February 11.59 pm
<b>Submission Method</b>	Online
<b>Assessment Criteria</b>	Correct answers
<b>Return Method</b>	Online
<b>Feedback Provided</b>	Feedback will be discussed the following day in class.

## Assessment 4 - Quiz 4

<b>Assessment Type</b>	Quiz
<b>Description</b>	Quiz based on content covered in Thursday's lecture and tutorial. Quizzes can be attempted as many times as necessary (without penalty).
<b>Weighting</b>	20%
<b>Due Date</b>	Sunday 18 <sup>th</sup> February 11.59 pm
<b>Submission Method</b>	Online
<b>Assessment Criteria</b>	Correct answers
<b>Return Method</b>	Online
<b>Feedback Provided</b>	Feedback will be discussed the following day in class.

## Assessment 5 - Quiz 5

<b>Assessment Type</b>	Quiz
<b>Description</b>	Quiz based on content covered in Friday's lecture and tutorial. Quizzes can be attempted as many times as necessary (without penalty).
<b>Weighting</b>	20%
<b>Due Date</b>	Sunday 18 <sup>th</sup> February 11.59 pm
<b>Submission Method</b>	Online
<b>Assessment Criteria</b>	Correct answers
<b>Return Method</b>	Online
<b>Feedback Provided</b>	Available via request.

# ADDITIONAL INFORMATION

## Grading Scheme

This course is graded as follows:

Grade	Description
Ungraded Pass (UP)	There are no marks associated with this result and you have met the level requirements to pass the course.
Fail (FF)	Failure to satisfactorily achieve assessment objectives or compulsory course requirements. A fail grade may also be awarded following disciplinary action.

## Communication Methods

**Email** is the principal form of communication at the university and within this course. Always use your student email (NUmail), rather than a private email address, and check this regularly. As Course Coordinator I will try to respond to your email within three (3) working days. I will not normally respond to emails over the weekends. Please be courteous in your email communication and in the online space. The University of Newcastle has a [Code of Conduct](#) that covers all communications in the University for staff and students.

**Canvas** is used to distribute course material, announcements and other information. It is also used for online quizzes and to allow students to track their individual progressive assessment results via Grades.

**Discussions forums** in Canvas can be used to ask questions about minor issues. Students are strongly encouraged to use these to communicate with each other, discuss issues relating to the course, and solve minor problems.

## 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 Adverse Circumstances must be lodged via the online Adverse Circumstances system for all individual assessment items worth 30% or greater **by 11:00pm on the day the assessment is due**. For assessment items less than 30%, you will need to contact your Course Coordinator by 11:00pm on the due date of the assessment item.

Before applying you must refer to the [Adverse Circumstances Affecting Assessment Items Procedure](#) and the [Adverse Circumstances Affecting Assessment Items Policy](#).

Please note that students must submit their adverse circumstances application via the online Adverse Circumstances system by 11:00pm on the due date of the assessment item, even if you are using a [Reasonable Adjustment Plan \(RAP\)](#) as your supporting documentation.

## 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. Please refer to the [Student Academic Integrity Policy](#).

## Workplace Health and Safety Requirements

There are no specific WH&S requirements for this course.

## 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](#) that support a safe and respectful environment at the University.

## 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.

## Timetable

Your timetable for this course is available via the myUni Student Portal and can also be found [here](#).

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<b>Software</b>	Free Microsoft Office software is available to enrolled students <a href="#">here</a> and includes 5 TB of free cloud storage with OneDrive.
<b>Written Assessment Word Limits</b>	Word limits for your written assessments includes headings, sub-heading, in-text citations, quotes and referencing but does not include the list of references, appendices and footnotes. You will not receive a penalty for exceeding the word limit (there is a tolerance of up to 10%), but any work after the maximum word limit may not be included within the allocation of marks.

*This course outline was approved by the Director, PALS. No alteration of this course outline is permitted without Director 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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