

# PX308-7.5 Physics in Medicine

**21/22**

**Department**

Physics

**Level**

Undergraduate Level 3

**Module leader**

Gavin Morley

**Credit value**

7.5

**Module duration**

5 weeks

**Assessment**

100% exam

**Study location**

University of Warwick main campus, Coventry

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## Description

### Introductory description

Physics and physical measurement techniques are essential to diagnostics and therapies in medicine. This module concentrates on five major areas: magnetic resonance imaging, nuclear medicine, radiotherapy, ultrasound in medicine and X-ray imaging and tomography. The aim of the module is to demonstrate the application of physical principles to these important areas of medical physics.

[Module web page](#)

### Module aims

To show how some of the physics learnt in a number of core modules may be applied in an important area outside of physics.

### Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

An introduction to some of the applications of physics in medicine. Five major topics:

1. Magnetic resonance imaging
2. Nuclear medicine
3. Radiotherapy
4. Ultrasound in medicine
5. X-ray imaging and tomography

## Learning outcomes

By the end of the module, students should be able to:

- Explain the physical principles underlying the five areas of the application of physics to medicine covered in the module
- Discuss the advantages and drawbacks of each of these therapeutic or investigative techniques
- Describe some current research into ways in which the techniques of medical physics might be improved.

## Indicative reading list

S. Webb (Ed), The Physics of Medical Imaging, Hilger  
B.H. Brown et. al., Medical Physics and Biomedical Engineering IOPP;  
G. Steele, Basic Clinical Radiobiology, Arnold;  
Bomford et. al., Walter and Miller's textbook of radiotherapy, Churchill.

[View reading list on Talis Aspire](#)

## Interdisciplinary

Medicine uses anything it can to understand and treat illness. It has imported many techniques and therapies from physics (radiology, radiotherapy, MRI, acoustics) as well as from other disciplines. This module looks at how physics is applied in medicine.

## Subject specific skills

Knowledge of physics relevant to medicine. Skills in modelling, reasoning, thinking.

## Transferable skills

Analytical, communication, problem-solving, self-study

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## Study

## Study time

Type	Required
Lectures	15 sessions of 1 hour (20%)
Private study	60 hours (80%)
Total	75 hours

## Private study description

Working through lecture notes, solving problems, wider reading, discussing with others taking the module, revising for exam, practising on past exam papers

## Costs

No further costs have been identified for this module.

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## Assessment

You must pass all assessment components to pass the module.

### Assessment group B2

	Weighting	Study time	Eligible for self-certification
<b>Assessment component</b>			
In-person Examination Answer two out of three questions	100%		No

Reassessment component is the same

## Feedback on assessment

Personal tutor, group feedback

[Past exam papers for PX308](#)

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## Availability

## Courses

This module is Option list A for:

- Year 3 of UPXA-F300 Undergraduate Physics (BSc)
- Year 3 of UPXA-F303 Undergraduate Physics (MPhys)
- Year 4 of UPXA-F301 Undergraduate Physics (with Intercalated Year)

This module is Option list B for:

- UMAA-G105 Undergraduate Master of Mathematics (with Intercalated Year)
  - Year 3 of G105 Mathematics (MMath) with Intercalated Year
  - Year 5 of G105 Mathematics (MMath) with Intercalated Year
- Year 3 of UMAA-G100 Undergraduate Mathematics (BSc)
- UMAA-G103 Undergraduate Mathematics (MMath)
  - Year 3 of G100 Mathematics
  - Year 3 of G103 Mathematics (MMath)
  - Year 4 of G103 Mathematics (MMath)
- UMAA-G106 Undergraduate Mathematics (MMath) with Study in Europe
  - Year 3 of G106 Mathematics (MMath) with Study in Europe
  - Year 4 of G106 Mathematics (MMath) with Study in Europe
- Year 3 of UPXA-FG33 Undergraduate Mathematics and Physics (BSc MMathPhys)
- Year 3 of UPXA-GF13 Undergraduate Mathematics and Physics (BSc)
- UPXA-FG31 Undergraduate Mathematics and Physics (MMathPhys)
  - Year 3 of GF13 Mathematics and Physics
  - Year 3 of FG31 Mathematics and Physics (MMathPhys)
- Year 4 of UPXA-GF14 Undergraduate Mathematics and Physics (with Intercalated Year)
- Year 4 of UMAA-G101 Undergraduate Mathematics with Intercalated Year
- Year 3 of UPXA-F303 Undergraduate Physics (MPhys)