UNIVERSITY OF LIVERPOOL

MSc

Radiometrics: Instrumentation and Modelling

Study mode	Duration
Full-time	12 months
Part-time	Up to 72 months

Apply by: **29 August 2025**
Starts on: **22 September 2025**

About this course

The MSc in Radiometrics will teach you a broad range of detector technologies for measuring ionising radiation that are widely used in nuclear-related industries, equipping you for a career in any industry involving radiation and radiation detectors.

Introduction

Teaching will cover basic radiation principles, the use of detection systems and associated instrumentation applications, and modelling. There's a strong focus on practicals and laboratory-based techniques.

The MSc in Radiometrics will teach you a broad range of detector technologies for measuring ionising radiation that are widely used in nuclear-related industries. It has a strong emphasis on practical laboratory skills using the state-of-the art equipment in our teaching laboratories, complementing the theoretical knowledge and advanced modelling skills you will learn. Many modules are also taken by participants from industry as part of their Continuing Professional Development, so you will have opportunities to learn first hand about what it's like to work at some of the UK's leading employers in the sector.

The project during the summer will give you a chance to conduct individual open-ended research under expert supervision. You'll be able to carry out the project, often

in industry, making you even more employable in sectors such as nuclear power, medicine, environmental protection, oil and mining, and health and safety.

Who is this course for?

This course is suitable for students with first degrees in physical sciences and engineering who are looking for a career in sectors such as nuclear-related industries, healthcare, security, radiation protection and environmental monitoring, as well as further study.

What you'll learn

- Advanced laboratory practical skills
- Computer modelling skills
- Theoretical knowledge related to detector technologies used for measuring ionising radiation in a wide range of employment sectors

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Course content

Discover what you'll learn, what you'll study, and how you'll be taught and assessed.

Semester one

The programme consists of a number of one-week basic modules and their associated applied modules, which you can select to best meet your needs.

To gain your MSc qualification you must complete your dissertation and project (these are compulsory) and your chosen modules, totalling 180 credits.

Students who study part-time will complete all the taught modules, then the applied modules, followed by the final dissertation and project.

Modules

Compulsory modules	Credits
HIGH RESOLUTION GAMMA SPECTROMETRY (PHYS804)	15
ALPHA SPECTROMETRY (PHYS806)	15
NEUTRONS: DETECTION AND MODELLING (PHYS807)	15
STATISTICS (PHYS809)	7.5
RADIATION PROTECTION AND DOSIMETRY (PHYS810)	15
RADIATION SHIELDING (PHYS820)	15
APPLIED HIGH RESOLUTION GAMMA SPECTROMETRY (PHYS824)	7.5
APPLIED ALPHA SPECTROMETRY (PHYS826)	7.5
APPLIED NEUTRONS: DETECTION AND MODELLING (PHYS827)	7.5

Compulsory modules	Credits
STATISTICS, DATA COLLECTION AND ANALYSIS (PHYS829)	7.5
APPLIED RADIATION PROTECTION AND DOSIMETRY (PHYS830)	7.5
RADIATION SHIELDING ASSIGNMENT (PHYS840)	7.5

Programme details and modules listed are illustrative only and subject to change.

Semester two

During Semester two you will start work on your dissertation, PHYS843, which should be submitted before starting work on your project over the summer.

Modules

Compulsory modules	Credits
GAMMA-RAYS: DETECTION AND MODELLING (PHYS805)	7.5
NUCLEAR INSTRUMENTATION (PHYS808)	15
APPLIED GAMMA RAY: DETECTION AND MODELLING (PHYS825)	7.5
APPLIED NUCLEAR INSTRUMENTATION (PHYS828)	7.5
DISSERTATION FOR THE MSC IN RADIOMETRICS (PHYS843)	15

Programme details and modules listed are illustrative only and subject to change.

Final project

To gain your MSc you will need to complete an extended project for PHYS841 which will mainly be worked on during the summer

Modules

Compulsory modules	Credits
PROJECT (PHYS841)	60

Programme details and modules listed are illustrative only and subject to change.

Teaching and assessment

How you'll learn

You will be taught through a mixture of lectures, practical laboratory work, computer modelling classes, supervised project work and will carry out private study.

How you're assessed

A range of methods will be used for assessments, including exams, coursework essays, computer assignments and practical laboratory work. You will also complete a dissertation and write a report on your project work.

Liverpool Hallmarks

We have a distinctive approach to education, the Liverpool Curriculum Framework, which focuses on research-connected teaching, active learning, and authentic assessment to ensure our students graduate as digitally fluent and confident global citizens.

The Liverpool Curriculum framework sets out our distinctive approach to education. Our teaching staff support our students to develop academic knowledge, skills, and understanding alongside our **graduate attributes**:

- Digital fluency
- Confidence
- Global citizenship

Our curriculum is characterised by the three **Liverpool Hallmarks**:

- Research-connected teaching

- Active learning
- Authentic assessment

All this is underpinned by our core value of **inclusivity** and commitment to providing a curriculum that is accessible to all students.

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Careers and employability

This course will equip you with the necessary specific skills for a career in any industry involving radiation and radiation detectors. You will also develop valuable transferrable skills for other industries or to go on to further study.

Previous graduates have begun careers in academia and other research environments, in industry (for example in the nuclear and nuclear related industries), in financial services, health services, the scientific civil service and further education both in the UK and abroad.

Career support from day one to graduation and beyond

Career planning

From education to employment

Networking events

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Fees and funding

Your tuition fees, funding your studies, and other costs to consider.

Tuition fees

UK fees (applies to Channel Islands, Isle of Man and Republic of Ireland)

Full-time place, per year - £12,500
Part-time place, per year - £6,250

International fees

Full-time place, per year - £28,300
Part-time place, per year - £14,150

Fees stated are for the 2025-26 academic year. The part-time fees are based on a course duration of two years. Fees may vary on a pro-rata basis for alternative part-time course durations.

Tuition fees cover the cost of your teaching and assessment, operating facilities such as libraries, IT equipment, and access to academic and personal support.

- You can pay your tuition fees in instalments.
- All or part of your tuition fees can be funded by external sponsorship.
- International applicants who accept an offer of a place will need to pay a tuition fee deposit.

If you're a UK national, or have settled status in the UK, you may be eligible to apply for a Postgraduate Loan worth up to £12,167 to help with course fees and living costs. **Learn more about paying for your studies.**.

Additional costs

We understand that budgeting for your time at university is important, and we want to make sure you understand any course-related costs that are not covered by your

tuition fee. This could include buying a laptop, books, or stationery.

Find out more about the additional study costs that may apply to this course.

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Entry requirements

The qualifications and exam results you'll need to apply for this course.

Postgraduate entry requirements

We accept a 2:2 honours degree from a UK university, or an equivalent academic qualification from a similar non-UK institution. This degree should be in a physical science, or a closely related subject. Relevant industrial experience can be an alternative, subject to references.

We also encourage applications from those from non-traditional backgrounds, for example with relevant industrial experience, in lieu of a degree. Each application will be assessed on its own merits and subject to references.

International qualifications

Select your country or region to view specific entry requirements.

If you hold a bachelor's degree or equivalent, but don't meet our entry requirements, a Pre-Master's can help you gain a place. This specialist preparation course for postgraduate study is offered on campus at the **University of Liverpool International College**, in partnership with Kaplan International Pathways. Although there's no direct Pre-Master's route to this MSc, completing a Pre-Master's pathway can guarantee you a place on many other postgraduate courses at The University of Liverpool.

English language requirements

You'll need to demonstrate competence in the use of English language, unless you're from a majority English speaking country.

We accept a variety of international language tests and country-specific qualifications.

International applicants who do not meet the minimum required standard of English language can complete one of our Pre-Sessional English courses to achieve the required level.

IELTS

IELTS 7.0 overall with no component below 5.5

TOEFL iBT

100 overall, with minimum scores of listening 17, writing 17, reading 17 and speaking 19. TOEFL Home Edition not accepted.

Duolingo English Test

125 overall, with speaking, reading and writing not less than 105, and listening not below 100

Pearson PTE Academic

69 overall, with no component below 59

LanguageCert Academic

75 overall, with no skill below 60

PSI Skills for English

C1 Pass in all bands

INDIA Standard XII

National Curriculum (CBSE/ISC) - 75% and above in English. Accepted State Boards - 80% and above in English.

WAEC

C6 or above

Pre-sessional English

Do you need to complete a Pre-sessional English course to meet the English language requirements for this course?

The length of Pre-sessional English course you'll need to take depends on your current level of English language ability.

Pre-sessional English in detail

If you don't meet our English language requirements, we can use your most recent IELTS score, or the equivalent score in selected other English language tests, to determine the length of Pre-sessional English course you require.

Our Pre-sessional English courses vary from 6, 10, 12, 20, 30 or 40 weeks.

You can email us at elc@liverpool.ac.uk for advice on the length of Pre-sessional English course you require. Please let us know your most recent score in one of the following English languages tests so we can assess your current English language ability:

- IELTS
- LanguageCert Academic
- Pearson PTE
- Skills for English
- Oxford Test for English
- Duolingo English Test

We'll be in touch to let you know the length of Pre-sessional English course you require. We'll also confirm whether you can study Pre-Sessional English on campus or online.

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Generated: 28 Mar 2025, 07:43