

## **Programme of study for Doctor of Philosophy – Nuclear Science and Engineering 2024/25**

This programme is delivered as part of the EPSRC Centre for Doctoral Training in SATURN (Skills And Training Underpinning a Renaissance in Nuclear), and is delivered in partnership with University of Manchester (lead partner), Lancaster University, University of Liverpool, University of Sheffield and University of Strathclyde.

**Entry Requirements:** Applicants will normally be required to have obtained a relevant degree at least equivalent to a UK upper second class (2:1) honours degree. International PGRs will normally be required to have achieved at least 6.0 on IELTS (with no component below 5.5) or an equivalent English language qualification.

Equivalent academic and English Language qualifications can be found on the University website at <https://www.leeds.ac.uk/research-applying/doc/applying-research-degrees>

There is normally one entry point in October of each academic session.

This programme is not available for study on a Split-site or Distance Learning basis.

### **Duration of the Programme (excluding overtime period)**

- 4 years FT

### **Programme Outline**

#### **Year 1**

60 credits of modules consisting of 45 credits of taught modules and 15 credits of student-specific training modules:

- JUMNNG001 Introduction to the Chemistry and Physics of the Nuclear Fuel Cycle (15 credits)
- JUMNNG002 Materials Science in the Nuclear Fuel Cycle (15 credits)
- JUMNNG003 Environmental Radiochemistry and the Science of Radioactive Waste Disposal (15 credits)
- CAPE5996M CDT Short Research Projects (15 credits)

JUMN modules are managed by the University of Manchester and delivered in partnership with other CDT partner universities above.

Additional non-modular training programme activities (technical visits, outreach, communication training, attendance at Winter School, 'Dragons Den').

Candidates will be required to attend the University of Manchester for the majority of semester 1, and are normally expected to be resident in Manchester during this period. They are also expected to attend for a week at Strathclyde University and a week at the University of Sheffield.

Commencement of PhD research.

Candidates will be required to pass all 60 credits to progress to Year 2

#### **Year 2**

Continuation of PhD research.

Full-time candidates must submit their Transfer report and undergo assessment by no later than 18 months from the start of the candidature and will be required to successfully transfer to full PhD status by no later than Month 24 in order to progress on the programme.

### **Year 3**

Continuation of PhD research.

### **Year 4**

The PGR will continue research under the direction of their supervisor(s).

### **Thesis submission deadline**

Candidates are strongly encouraged to submit their thesis within the Standard Period of Study (4 years), which will usually coincide with the funding period for CDT-funded candidates.

Where an overtime period is required to complete the writing up of the thesis, the thesis submission deadline is the end of month 60.

### **Exit Qualification**

Candidates who are unsuccessful in their doctoral degree but who have successfully completed 60 credits of modules, may be eligible for the award of Postgraduate Certificate, provided that they have satisfied the relevant regulations for the award of these qualifications as set out in Ordinance XI (Taught Postgraduate Awards) and the Rules for award.

## **Learning Outcomes / Transferable Key Skills / Learning Context /Assessment for PhD**

### **1. Learning Outcomes**

On completion of the research programme PGRs should have shown evidence of being able:

- to discover, interpret and communicate new knowledge through original research and/or scholarship of publishable quality which satisfies peer review;
- to present and defend original research outcomes which extend the forefront of a discipline or relevant area of professional/clinical practice;
- to demonstrate systematic and extensive knowledge of the subject area and expertise in generic and subject/professional skills;
- to take a proactive and self-reflective role in working and to develop professional relationships with others where appropriate;
- to independently and proactively formulate ideas and hypotheses and to design, develop, implement and execute plans by which to evaluate these;
- to critically and creatively evaluate current issues, research and advanced scholarship in the discipline;
- to demonstrate systematic knowledge of and be able to critically assess, analyse and engage with the ethical and legal context of their research and any ethical and legal implications of their research.

### **2. Transferable (Key) Skills**

PGRs will have had the opportunity to acquire the following abilities through the research training and research specified for the programme:

- the skills necessary for a career as a researcher and/or for employment in a senior and leading capacity in a relevant area of professional/clinical practice or industry;
- evaluating their own achievement and that of others;
- self-direction and effective decision making in complex and unpredictable situations;
- independent learning and the ability to work in a way which ensures continuing professional development;

### **3. Learning Context**

This will include the critical analysis of, and decision making in, complex and unpredictable professional and/or clinical situations. The structure of the programme will provide research and/or professional training, breadth and depth of study and opportunities for drawing upon appropriate resources and techniques. Opportunities will be provided for PGRs to:

- develop to a high level interests and informed opinions;
- develop to a high level their design and management of their learning activities;
- develop to a high level their communication of their conclusions;
- make an original contribution to the field
- PGRs will be expected to engage in the exercise of autonomous initiative in their study and work in professional environments.

### **4. Assessment**

Achievement will be assessed by the examination of the candidate's thesis and performance under oral examination. Assessment will involve the achievement of the candidate in:

- evidencing an ability to conduct original and independent broad and in-depth enquiry within the discipline or within different aspects of the area of professional / clinical practice normally leading to published work;
- drawing on and/or developing a range of research techniques and methodologies appropriate to enquiries into the discipline/area of professional practice;
- demonstrating independent critical ability in the application of breadth and depth of knowledge to complex issues within the discipline or specialist area of professional/clinical practice;
- drawing on a range of perspectives on the area of study;
- evaluating and criticising received opinion;
- making reasoned and well-informed judgements on complex issues within the specialism whilst understanding the limitations on judgements made in the absence of complete data;
- the written style and overall presentation of the thesis