# Programme Specification

Postgraduate

Applicable to postgraduate programmes

Please click [here](#) for guidance on completing this specification template.

## Part A: Programme Summary Information

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td><strong>Title of programme:</strong> Nuclear Science and Engineering</td>
</tr>
<tr>
<td>2.</td>
<td><strong>Programme Code:</strong> EGNS</td>
</tr>
<tr>
<td>3.</td>
<td><strong>Entry Award(s):</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Credit:</strong></td>
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<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MA</td>
</tr>
<tr>
<td></td>
<td>MSc</td>
</tr>
<tr>
<td>X</td>
<td>PGDip</td>
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<tr>
<td></td>
<td>PGCert</td>
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<tr>
<td></td>
<td>DPS</td>
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<tr>
<td></td>
<td>CPS</td>
</tr>
<tr>
<td></td>
<td>Other (please specify below):</td>
</tr>
<tr>
<td>4.</td>
<td><strong>Exit Awards:</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Credit:</strong></td>
</tr>
<tr>
<td>X</td>
<td>PGDip</td>
</tr>
<tr>
<td>X</td>
<td>PGCert</td>
</tr>
<tr>
<td></td>
<td>CPS</td>
</tr>
</tbody>
</table>

Exit awards will automatically bear the name of the entry award. If an exit award is to be unnamed (i.e. it will show only the qualification achieved) or if it is to have a different name from the entry qualification you must indicate this below:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<tbody>
<tr>
<td>5.</td>
<td><strong>Date of first intake:</strong> September 2014</td>
</tr>
<tr>
<td>6.</td>
<td><strong>Frequency of intake:</strong> Annually in September</td>
</tr>
</tbody>
</table>
## Programme Specification PG

### 7. Duration and mode of study:
- **12 Months, Full time**

### 8. Applicable framework:
- **University Framework for Full-time and Part-time Postgraduate Programmes**

#### Framework exemption required:
- **X** No (please go to section 9)
- **☐** Yes (please provide a brief summary below)

### 9. Applicable Ordinance:
- **Ordinance 42**

#### New/revised Ordinance required:
- **X** No (please go to section 10)
- **☐** Yes (please provide a brief summary below)

### 10. Faculty:
- **Science and Engineering**

### 11. Level 2
#### School/Institute:
- **School of Engineering**

### 12. Level 1 unit:

### 13. Campus:
- **Main University Campus**

### 14. Other contributors from UoL:
- **School of Electrical Engineering, Electronics and Computer Science; School of Physical Sciences; School of Environmental Sciences**

### 15. Teaching other than at UoL:
- The universities in the NGN CDT consortium will be collaborating to deliver ENGG425 and ENGG422. The assessment of these modules will be performed or moderated by academic staff from the University of Liverpool. In addition the consortium consists of the University of Manchester; University of Leeds; University of Lancaster; University of Sheffield.

### 16. Director of Studies:
- **Professor Eann Patterson**

### 17. Board of Studies:
- **School of Engineering**
18: Board of Examiners: School of Engineering

19. External Examiner(s):
Name
Institution
Position

20. Professional, Statutory or Regulatory body: Not Applicable

21: QAA Subject benchmark Statements(s): None Available

22. Other reference points:

23. Fees: Standard University Fees

24. Additional costs to the student: None

25: AQSC approval: None

Part B: Programme Aims & Objectives

26. Aims of the Programme

The diploma programme is designed to provide research training in the first year of a four-year programme leading to a PhD with the EPSRC Next Generation Nuclear Centre for Doctoral Training.

The aims, learning outcomes, skills and attributes identified below are common across the multi-institutional Next Generation Nuclear Centre for Doctoral Training.

No. Aim:
1 To provide an introduction nuclear science and engineering.
2 To develop both generic research skills appropriate to the nuclear industry and specific research skills required to support PhD-level research programme.
3 To provide a comprehensive and broad overview of contemporary issues and applications associated with nuclear science and engineering.

27. Learning Outcomes

No. Learning outcomes – Master’s degree

Learning Outcomes

No. Learning outcomes – Postgraduate Diploma

1 A knowledge and understanding to a PG Diploma level of Nuclear Physics, Nuclear Chemistry, the Nuclear Fuel Cycle, Nuclear Engineering, Structural Engineering, Fuel Reactors & Strategic Materials, Risk Assessment & Decision Making, Radiation Effects, Radioactive Waste and the
Environmental/Biogeochem/Nuclear Legacy.

2 Understanding of the nuclear industry's operations and procedures.

3 Ability to undertake independent research in the field of nuclear science and engineering.

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### Learning Outcomes

**No.** | **Learning outcomes – Postgraduate Certificate**
--- | ---
2 | Understanding of the nuclear industry's operations and procedures.
3 | Ability to undertake independent research in the field of nuclear science and engineering.

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#### 27a. Mapping of subject-based learning outcomes:

<table>
<thead>
<tr>
<th>Learning outcome No.</th>
<th>Module(s) in which this will be delivered</th>
<th>Mode of assessing achievement of learning outcome</th>
<th>PSRB/Subject benchmark statement (if applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to Nuclear Science and Engineering</td>
<td>Viva, Continuous assessments and presentations</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>NGN Skills</td>
<td>Site visit reports</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>NGN Research Skills</td>
<td>Project work</td>
<td></td>
</tr>
</tbody>
</table>

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#### 28. Skills and Other Attributes

<table>
<thead>
<tr>
<th>No.</th>
<th>Skills and attributes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ability to work safely in nuclear industry or laboratory environment.</td>
</tr>
<tr>
<td>2</td>
<td>Computational skills relevant to nuclear science and engineering.</td>
</tr>
<tr>
<td>3</td>
<td>Quantitative analysis for research purposes.</td>
</tr>
<tr>
<td>4</td>
<td>Problem identification and solution in a nuclear science and engineering context.</td>
</tr>
<tr>
<td>5</td>
<td>Evaluate and communicate scientific and technical information from research investigations.</td>
</tr>
<tr>
<td>6</td>
<td>Synthesis of information.</td>
</tr>
<tr>
<td>7</td>
<td>Time management.</td>
</tr>
</tbody>
</table>

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#### 28a. Mapping of skills and other attributes:

<table>
<thead>
<tr>
<th>Skills and other attributes No.</th>
<th>Module(s) in which this will be delivered and assessed</th>
<th>Learning skills, research skills, employability skills</th>
<th>Mode of assessing achievement of the skill or other attribute</th>
</tr>
</thead>
</table>

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1. Intro to NSE, NGN Research Skills  
Employability & research  
Viva

2. Intro to NSE, NGN Skills, NGN Research Skills  
Employability & research  
Continuous assessment

3. Intro to NSE, NGN Research Skills  
Employability & research  
Continuous assessment

4. Intro to NSE, NGN Research Skills  
Employability & research  
Continuous assessment

5. NGN Skills, NGN Research Skills  
Employability, learning & research  
Assignments

6. NGN Research Skills  
Employability, learning & research  
Project presentation & report

7. Intro to NSE, NGN Skills, NGN Research Skills  
Employability, learning & research

29. Career opportunities:
Nuclear fuel cycle operations, nuclear power generation, research and development in nuclear science and engineering.

Part C: Entrance Requirements

30. Academic Requirements:
1st or 2:1 MEng or Distinction, Merit in MSc in a relevant science or engineering discipline.

31. Work experience:
Desirable but not required.

32. Other requirements:
Enter to the NGN CDT is restricted to Home students and EU students with the explicit approval of the CDT PIs. This restriction arises due to the need to meet security requirements for visits to nuclear sites that are an essential part of the course.

Part D: Programme Structure

33. Programme Structure:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Level</th>
<th>Semester</th>
<th>Exam:</th>
<th>CW</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGG425</td>
<td>Introduction to Nuclear Science &amp; Engineering</td>
<td>45</td>
<td>7</td>
<td>1</td>
<td>0:100</td>
<td></td>
</tr>
<tr>
<td>ENGG422</td>
<td>NGN Winter School &amp; Skills Training</td>
<td>15</td>
<td>7</td>
<td>1,2,3</td>
<td>0:100</td>
<td></td>
</tr>
<tr>
<td>ENGG423</td>
<td>NGN Research Skills I</td>
<td>30</td>
<td>7</td>
<td>2</td>
<td>0:100</td>
<td></td>
</tr>
<tr>
<td>ENGG424</td>
<td>NGN Research Skills II</td>
<td>30</td>
<td>7</td>
<td>0</td>
<td>0:100</td>
<td></td>
</tr>
</tbody>
</table>

34. Industrial placement/work placement/year abroad:
It is intended that all CDT NGN studentships will be sponsored by industry and so students will be expected to spend periods at the premises of their sponsor during semester 2 and 3.
35. **Liaison between the Level 2 Schools/Institutes involved:**

The taught material will be delivered by the School of Engineering. The co-PI for the CDT NGN is the course director and participates in monthly meetings with the other co-PIs in the CDT NGN to coordinate the taught programme and the management of the research projects.

### Part E: Learning, Teaching and Assessment Strategies

36. **Learning, Teaching and Assessment Strategies:**

The CDT will use a wide range of strategies centred around short intensive teaching periods for the whole cohort and tailored training for individuals in preparation for their PhD research programme. The tailored training will be provided on-campus in Liverpool and at the site of industrial sponsors.

The intensive teaching periods will be taught collaboratively by the academic staff from the universities in the NGN CDT consortium, i.e. Manchester, Lancaster, Leeds, Sheffield and Liverpool. The assessment of Liverpool students will be either performed or moderated by academic staff from the University of Liverpool. The intensive teaching periods will be supported by pre-module reading assignments and post-module application assignments in which students will apply the material delivered during the intensive contact time. Traditional lectures, tutorials, seminars, laboratory work as well as plant and site visits will be employed to deliver the programme.

36a. **Learning, Teaching and Assessment methods:**

<table>
<thead>
<tr>
<th>Lectures</th>
<th>Group work</th>
<th>Individual project work</th>
<th>Private study</th>
<th>Laboratory work</th>
</tr>
</thead>
</table>

37. **Assessment information for students:**

**Code of Practice on Assessment**

The University has a Code of Practice on Assessment which brings together the main institutional policies and rules on assessment. The Code is an authoritative statement of the philosophy and principles underlying all assessment activities and of the University's expectations in relation to how academic subjects design, implement and review assessment strategies for all taught programmes of study.

The Code of Practice includes a number of Appendices which provide more detail on the regulations and rules that govern assessment activity; these include:

- The University marks scale, marking descriptors and qualification descriptors;
- The framework for modular, postgraduate programmes;
- Information about students’ progress, including guidance for students;
- The procedure for assessment appeals;
- Regulations for the conduct of exams;
- The University’s policy on making adjustments to exam arrangements for disabled students.
- The code of practice relating to external examining (see also below)
- The Academic Integrity Policy, which covers matters such as plagiarism and
collusion and includes guidance for students;
The policy relating to mitigating circumstances which explains what you should do
if you have mitigating circumstances that have affected assessment; and
The policy on providing students with feedback on assessment.

Please click here to access the Code of Practice on Assessment and its
appendices; this link will also give you access to assessment information that is
specific to your cohort:

A summary of key assessment information is also available in the ‘Your University’
handbook.

**Marking criteria:**

The following documents contain full details on assessment; they are updated
annually and made available to students:

**Pass marks**
The pass mark for each module is 50% (this includes any Level 6 modules
included in a PGT programme).

**Compensation and re-sits**

**Compensation**
Where the average of the total marks in all modules is 50% or above, a mark in
the range 40 – 49% shall be deemed **compensatable** in ‘taught’ modules
totalling up to 20 credits; compensation cannot apply to any ‘independent
research’ modules. Where more than 20 credits are failed with marks in the 40-
49% range, none of the failed modules will be compensatable, even if the
average of the total marks in all modules is 50% or above.

**Re-sits**
Students who fail taught modules may re-sit those modules on one further
occasion only. Re-sits should normally take place within the registration period.
A failed dissertation or assessed work from an independent research module
may also be resubmitted on one further occasion only. For full-time and part-
time students the dissertation must be resubmitted within the one year of the
original date of first submission.

Marks achieved in re-sit examinations will be recorded as the actual mark
achieved but shall be flagged in the transcript to indicate that they were
achieved at a second attempt.

**Marking descriptors**
The marking descriptors for the School of Engineering will be used in marking
all work on this programme. These are:

90-100% ‘Outstanding’: Total coverage of the task set. Exceptional
demonstration of knowledge and understanding appropriately grounded in
theory and relevant literature.

80-89% ‘Excellent’: As ‘Outstanding’ but with some minor weaknesses or gaps
in knowledge and understanding.

70-79% ‘Very Good’: Full coverage of the task set. Generally very good
demonstration of knowledge and understanding but with some modest gaps.
Good grounding in theory.
60-69% ‘Comprehensive’: As ‘Very Good’ but with more and/or more significant gaps in knowledge and understanding and some significant gaps in grounding.

50-59% ‘Competent’: Patchy coverage of the task set. Patchy knowledge and understanding with limited grounding in literature. Just meets the threshold level at the bottom end.

40-49% ‘Compensatable fail’: Some parts of the set task likely to have been omitted. Major gaps in knowledge and understanding. Some significant confusion. Very limited grounding. Falls just short of the threshold level.

25-40% ‘Deficient’: As ‘Compensatable Fail’ but with major omissions and/or major gaps in knowledge and understanding. Falls substantially below the threshold level.

0-25% ‘Extremely weak’: Substantial sections of the task not covered. Knowledge and understanding very limited and/or largely incorrect. No grounding in theory.

**Final award**

Students who attend for a minimum period of 12 months of full-time study, or for an equivalent period of part-time study, and who achieve a minimum 180 credit points with not more than 30 credit points at Level 6, and successfully complete a dissertation/research project worth 60 credits or two independent research modules totalling 60 credits (included within the 180 credits), will be eligible for the award of a Master’s degree.

Students who attend for a minimum period of 30 weeks of full-time study, or for an equivalent period of part-time study, and who achieve a minimum of 120 credit points with not more than 30 credit points at Level 6, will be eligible for the award of a Postgraduate Diploma. A Postgraduate Diploma entry award may not include a single 60 credit dissertation or project module among the credit to be achieved; credit achieved on a single 60 credit dissertation or project module, or two independent research modules totalling 60 credits, may only contribute to the award of a Postgraduate Diploma when it is an exit award. However, a Postgraduate Diploma entry award may include up to a maximum of 30 credits of independent research.

Students who attend for a minimum period of 15 weeks full-time study or for an equivalent period of part-time study, and who achieve a minimum of 60 credit points (which may in some circumstances include up to 30 independent research credits) with not more than 15 credit points at Level 6, will be eligible for the award of a Postgraduate Certificate.

A mark of Merit or Distinction will be awarded according to the criteria below, but only where the requirements are achieved at the first attempt. A Merit or Distinction cannot be awarded if a student has failed and then passed on re-sit any credit that counts towards the final award during the relevant period of study at the University, however marks achieved in modules which are passed under the compensation rule by be counted toward a Merit or Distinction.

It should be noted that students who register on a Master’s or Postgraduate Diploma but who exit with a lower award, will be eligible for a Merit or Distinction for the lower award, provided the student meets the criteria outlined
(i) For a Master’s Degree with Merit a student must achieve:
   • A mark of at least 60% for the dissertation, project or independent research modules; and
   • Marks of at least 60% in modules accounting for at least half of the credit of the overall award; and
   • An overall average mark of at least 60%.

(ii) For a Postgraduate Diploma with Merit a student must achieve:
   • Marks of at least 60% in modules accounting for at least half of the credit of the overall award; and
   • An overall average mark of at least 60%.

(iii) For a Postgraduate Certificate with Merit a student must achieve:
   • Marks of at least 60% in modules accounting for at least half of the credit of the overall award; and
   • An overall average mark of at least 60%.

(iv) For a Master’s Degree with Distinction a student must achieve:
   • A mark of at least 70% for the dissertation, project or independent research modules; and
   • Marks of at least 70% in modules accounting for at least half of the credit of the overall award; and
   • An overall average mark of at least 70%.

(v) For a Postgraduate Diploma with Distinction a student must achieve:
   • Marks of at least 70% in modules accounting for at least half of the credit of the overall award; and
   • An overall average mark of at least 70%.

(vi) For a Postgraduate Certificate with Distinction a student must achieve:
   • Marks of at least 70% in modules accounting for at least half of the credit of the overall award; and
   • An overall average mark of at least 70%.

Criteria for the award of an alternative qualification
If a student fails to meet the criteria for the award of a Master’s degree or a Postgraduate Diploma, or is unable to complete the programme he or she registered for, he or she will be eligible for the award of one of the following as an exit qualification:

Postgraduate Certificate in Civil and Environmental Engineering – this will be awarded to students who have previously registered for either the Master’s degree or Postgraduate Diploma provided that the student has achieved a minimum of 60 credits, with no more than 15 credits at Level 3; the credit may not include any dissertation, project or independent research credits.

Postgraduate Diploma in Civil and Environmental Engineering – this will be awarded to students who have previously registered for the Master’s degree provided that the student has achieved a minimum of 120 credits, with no more than 30 credits at Level 6; the 120 credits may include dissertation project or independent research credits to the value of 60 credits.
The Board of Examiners and the External Examiner

The academic progress of students is assessed by a Board of Examiners comprising the External Examiner(s), the academic staff, and any additional approved person(s). The role of the External Examiner is to ensure that degrees awarded in similar subjects in all universities in the United Kingdom are comparable in standard and that the assessment system used in the programme is fair and is fairly operated for all students. In order to achieve these purposes, the External Examiner:

(a) comments and gives advice on programme content, balance and structure, and on assessment procedures;
(b) participates in assessment processes for the award of degrees;
(c) participates in resolving problem cases.

The External Examiner is a full member of the Board of Examiners. He/she has the right to see all examination papers, examination scripts and other forms of assessment contributing to the decisions of the Board of Examiners. He may interview a representative group of students in order to obtain student feedback on the programmes.

The Board of Examiners is empowered to take into account extenuating circumstances such as illness or personal matters that may have adversely affected performance.

External Examiners are responsible for ensuring that awards made by the University of Liverpool are of a comparable standard with those of similar subjects and awards of other Higher Education Institutions in the United Kingdom, as stated in the Code of Practice on External Examining which is available at:


Project Assessment

Requirements and guidelines will be provided before the start of the project; these will include details of the project weighting, assessment requirements and submission deadline(s). The assessment criteria will include the following:

- An MSc(Eng) dissertation must provide evidence of in-depth understanding, mastery of research techniques, ability to assemble and analyse data, and assessment of outcomes.
- A Postgraduate Diploma dissertation must provide evidence of a breadth of knowledge, ability in analysing and evaluating complex concepts, and skills in experimental and/or computational work.

The presentation of the dissertation must be of a high standard (as described in the project guidelines).

Each project will be assessed by the project supervisor and at least one internal examiner; the External Examiner will moderate the assessment of the dissertations. Students may be required to present themselves for oral examination.

The pass mark for the project is 50%.

A Diploma student who achieves at least 50% in every taught module can pass with a 30-credit maximum project mark in the range 40-49%, this mark being regarded as ‘compensatable’. 
The Board of Examiners will determine a letter grade for each student for the project; the grades will normally correspond to the following overall average mark:

A: 70% or greater, B: 60-69%, C: 50-59%, D: 40-49%.

Provided that the department is satisfied with their progress, students with failing project marks will normally be permitted one re-submission of their dissertation by a date determined by the Board of Examiners (for which there would be a re-examination fee).

Further information on the assessment policies and procedures, including:
- Purpose, method and schedule of assessment
- Timescales for the submission of assessments
- The penalties for the late submission of assessments
- The rules relating to plagiarism and collusion
- Ill-health and other special factors

Can be found in the student handbook.

38. Student representation and feedback:

A student representative will be elected for each cross-institutional cohort of the NGN CDT and will meet with the CDT Director on regular basis to assist in developing the collaborative provision and to provide feedback.

A student representative will be elected to the School of Engineering PGT Staff-Student Liaison Committee in accordance with the University Code of Practice on Student Representation. The School of Engineering PGT Staff-Student Liaison Committee will normally meet at least three times a year. The membership of the School of Engineering PGT Staff-Student Liaison Committee, its terms of reference, and the manner in which it conducts its business will conform to the requirements of the Annex to the Code of Practice on Student Representation. Elections to the School of Engineering PGT Staff-Student Liaison Committee will be carried out within the structure determined by the University Student Representation Steering Group, and Programme Representatives will be encouraged to attend the training provided for them by the Guild of Students.

There is student representation on Engineering Board of Studies.

Questionnaires will be used to solicit feedback on modules and the programme, and this information will be reviewed by the Course Director and the Board of Studies so that appropriate action can be taken. The Course Director will arrange a number of extra-curricular events each year that will provide an opportunity for informal feedback as well as opportunities to interact with industry.

39. Status of Professional, Statutory or Regulatory Body Accreditation:
Part G: Diversity & Equality of Opportunity and Widening Participation

40. **Diversity & Equality of Opportunity and Widening Participation:**

The programme will be delivered using short (3-day) intensive teaching sessions instead of the traditional long-thin format for modules. This means that attention will be focussed on a single activity at any one time rather than several or all at once. This format should allow more flexible approaches to study and interactions with other activities. It is anticipated that this departure from the usual mode of delivery in the School of Engineering will assist in widening participation and encouraging a more diverse student population.

A range of teaching, learning and assessment methods will be used in recognition that there is a diversity of academic aptitudes and backgrounds.

ANNEX 1

Annex Of Modifications Made To The Programme

Please complete the table below to record modifications made to the programme.

<table>
<thead>
<tr>
<th>Description of modification (please include details of any student consultation undertaken or confirm that students’ consent was obtained where this was required)</th>
<th>Minor or major modifications</th>
<th>Date approved by FAQSC</th>
<th>Date approved by AQSC (if applicable)</th>
<th>Cohort affected</th>
</tr>
</thead>
<tbody>
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