

# Higher / Degree Level Apprenticeship Programme Specification

This programme specification is designed for prospective employers and their apprentices/students, academic staff, enrolled students and their employers. It provides a concise summary of the main features of the programme and the intended learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided.

<b>Programme Title and Name of Award</b>	BSc Honours Decommissioning & Waste Management		
<b>Academic Level</b>	6	<b>Total Credits</b>	120
<b>Apprenticeship Standard and Assessment Plan</b>	<a href="https://www.gov.uk/government/publications/apprenticeship-standard-nuclear-scientist-and-nuclear-engineer">https://www.gov.uk/government/publications/apprenticeship-standard-nuclear-scientist-and-nuclear-engineer</a>		
<b>LARS Code of the Apprenticeship Standard</b>	47	<b>LARS Code of the University Award</b>	tbc
<b>Professional Body Accreditation / Qualification</b>	Accreditation at Incorporated Engineer (IEng) and partial Chartered Engineer (CEng) will be sought from the Society of Operations Engineers		
<b>Date of Professional Body Accreditation</b>	Na	<b>Accreditation Period</b>	na
<b>Employer Organisation</b>			
<b>End Point Assessment</b>	Integrated		
<b>End Point Assessor</b>	University of Cumbria		
<b>JACS Code</b>	H821		
<b>HECoS Code</b>	100184		
<b>Criteria for Admission to the Programme</b>	Government funding rules require that an apprentice must have the right to live and work in the UK, must be in employment, paid at least the legal minimum wage and have a written and signed agreement for the apprenticeship with their employer. The minimum duration periods for an apprenticeship set in each Apprenticeship Standard, is based on an apprentice working a minimum of 30 hours per week. Where the apprentice works fewer than 30 hours, the minimum duration of the apprenticeship must be increased on a pro-rata basis.		

	<p>Funding for the apprenticeship is provided through the Employment and Skills Funding Agency (ESFA) and is paid in the following way:</p> <ul style="list-style-type: none"> <li>• Levy paying employers with sufficient funds in their digital account – 100% funding</li> <li>• Non Levy payers -90% ESFA funding, 10% Employer co-funding. Non-levy paying companies will be asked to pay their 10% of the full cost of the apprenticeship at the start of the programme.</li> </ul> <p>All Degree Apprentices must be interviewed, assessed and offered a position by an employer before being admitted to the degree. Although the College may receive direct applications and filter these applications before passing them to prospective employers, some apprentices may apply directly to an employer. Either way, after acceptance by an employer, the College will require a formal application, which it will assess according to the programme entry criteria:</p> <p><u>Selection criteria</u></p> <p>The entry requirements are aligned to the University of Cumbria’s admissions criteria. For <a href="#">APL</a>, please refer to the University website. Each candidate for APL will be advised how that may affect ESFA funding (for further information, see the University website).</p> <p>All students will be interviewed to assess their suitability for the course. Entry requires as a minimum 240 credits which must include 120 credits at level 5. Direct entrance can be achieved with a Foundation Degree or HND qualification with a relevant profile. Entry to the course can be via a relevant HND or Foundation Degree without a suitable profile if a course of bridging studies over a period of 1 semester is undertaken.</p> <p>An ideal entry will be a Foundation Degree at Merit level in Decommissioning &amp; Waste Management</p> <p><u>Exit from employment</u></p> <p>If an apprentice is made redundant during their apprenticeship through no fault of their own, then the employer and College have a legal duty to help the apprentice try to find alternative employment.</p> <p>If the redundancy is within six months of the planned completion date of the apprenticeship, then ESFA will fund 100% of the remaining agreed cost, even if the apprentice cannot find another employer.</p> <p>If the redundancy is over six months from the planned end date, the ESFA will fund the remaining agreed cost for 12 weeks to allow the apprentice to find alternative employment. Where a new employer cannot be found the apprentice will be recorded as having left the programme</p>
<b>Teaching Institution</b>	Lakes College West Cumbria
<b>Owning Department</b>	Lakes College – Nuclear University of Cumbria – Department of Science, Natural Resources

	and Outdoor Studies
<b>Programme delivered in conjunction with</b>	na
<b>Principal Mode of Delivery</b>	Face to Face
<b>Pattern of Delivery</b>	Part Time – Full Time
<b>Delivery Site(s)</b>	Lakes College West Cumbria – National College for Nuclear Building
<b>Programme Length</b>	Standard FT – 1 year Standard PT – 2 years Maximum – 4 years
<b>Higher Education Achievement Report (HEAR)</b>	Upon successful completion of this programme, you may receive a Diploma Supplement/Higher Education Achievement Report (HEAR).
<b>Exit Awards</b>	na
<b>Period of Approval</b>	January 2018 – December 2024

### Cumbria Graduate Attributes

Throughout your studies, you will be provided with the skills and knowledge relevant to the global workplace. All successful graduates of the University of Cumbria will be:

- Enquiring and open to change. This is a competence requirement for registration to the Engineering and Science councils. This degree encourages this competence through project work, practical investigations and learning from experience.
- Self-reliant, adaptable and flexible. To achieve success within this programmes there is a requirement for the student to manage their own learning. These particular attributes are embedded within the work based and project modules. These characteristics are also assessed competences for registration within the Engineering Council UK SPEC.
- Confident in your discipline as it develops and changes over time. The degree has been structured to develop the student’s technical ability and confidence through progression.
- Capable of working across disciplines and working well with others. This is developed through project work and group exercises and is also explored within the work based modules and projects. The ability to working as a team is part of an assessed competence within the Nuclear Apprenticeship standards at both level 5 and level 6.
- Confident in your digital capabilities
- Able to manage your own professional and personal development. The apprenticeship standards at levels 5 and 6 support professional development. The professional development module also provides an opportunity to create a portfolio of evidence for IEng registration applications.
- A global citizen, socially responsible and aware of the potential contribution of your work to the

cultural and economic wellbeing of the community and its impact on the environment

- • A leader of people and of places

## Programme Features

Degree Apprenticeships combine academic study and workplace learning to enable apprentices to gain a full bachelor's degree. This provision of an academic undergraduate degree is integrated with experience, practice and further learning in the workplace. The minimum duration of an apprenticeship is set in each Apprenticeship Standard and is based on a minimum 30 hour week. Where an apprentice works fewer than 30 hours, the apprenticeship minimum duration must be increased on a pro-rata basis. It is a legal requirement that the apprentice does not pay any training costs or student fees. Degree Apprenticeships are co-designed by employers ensuring that apprentices are equipped with the skills employers need and for their own future career (Source: The Future Growth of Degree Apprenticeships, Universities UK, March 2016)

The Standard and Assessment Plan for the Degree Apprenticeship in Nuclear Scientist and Nuclear Engineer have been designed by employers in the sector.

A Degree Apprenticeship programme integrates the provision of undergraduate degree level academic knowledge, understanding and skills with the opportunity to contextualise this provision in the workplace and thus to develop occupation competency at a professional level in specific job roles.

The programme has been designed to meet the employer-led national Standard and to follow the associated Assessment Plan, as well as being referenced to the QAA Subject Benchmarking Statement for Engineering (2015) and other academic standards. Apprentices, who are in permanent full-time professional employment, are also learning in the workplace in a structured delivery pattern, supported by both the College and the employer. In addition, the programme has been developed with the assistance of a range of local employers to ensure it meets the needs of the region.

This programme is part of a suite of degrees which have been developed to meet the need for Nuclear Clean-up and Remediation Engineers as identified within the Governments Nuclear Skills Strategy Document and sanctioned by the National Curriculum & Qualification Advisory Group for Nuclear (CQAG). The need for Electrical Power engineers is now an urgent requirement particular within the new infrastructure projects across the country which include new build nuclear power, high speed rail and numerous renewable energy projects.

The programme has been designed to provide seem-less progression pathway from the FSc Decommissioning & Waste Management degree whilst also providing progression opportunities for students who have a completed a relevant HND qualification. The programme also provides a unique learning experience and delivery will occur within the National College for Nuclear – Northern Hub building. The course delivery model will make significant use of experiential learning and delivery methods which can be defined as 'learning from doing'. Considerable use will be made of the project/technology centre supported by a virtual reality suite which will provide the students with a real time immersed experience of electrical power system environments.

The course will be delivered on a block basis which will provide an opportunity to undertake enhanced practical activities supporting technical theoretical delivery methods and embedding theoretical knowledge through experience, observation and reflection.

The course also consists of a professional development module and an industrial based dissertation. These modules provide an opportunity to further embed experiential learning within an industrial environment but also to provide a synergetic approach to an integrated degree apprenticeship. For PT students this work will take place within the normal place of work and for PT students' project work will

be selected to provide opportunities to experience a number of industrial case studies.

The Honours Degree in Decommissioning & Waste Management has been designed to provide opportunities to enter work as a Decommissioning Engineer or Nuclear Clean-up Engineer and in addition covers the knowledge based requirement of the level 6 Degree Apprenticeship Nuclear Engineer Standard.

## Aims of the Programme

The overall aims of the Programme are:

1. To provide students with an opportunity to assimilate a coherent body of knowledge appropriate to Decommissioning & Waste Management using a range of learning strategies
2. To encourage the students to work in a professional and ethical manner as described with the Engineering Council's Accreditation of Higher Education Programmes (AHEP) in engineering, in line with the UK Standard for Professional Engineering Competence (UK-SPEC)
3. To provide students with an honours degree experience that encourages innovation and the development of original concepts to define problems and derive solutions within the Decommissioning & Waste Management industry.
4. To encourage and develop observation, reasoning, reflection and analytical thinking powers to enable the embedding of work ready behaviours which are essential to Nuclear Clean-up environments
5. To enable the students to apply complex technology processes and procedures to real work scenarios
6. To enable the students to utilise new technology, management techniques and innovative solutions for the development of complex Decommissioning & Waste Management solutions
7. To provide graduates with technical knowledge and skills that will prepare them to be work ready and practice a range of techniques and systems within decommissioning & waste management projects and situations
8. To enable graduates to work and/or lead a team effectively when working within the decommissioning & waste management industry

## Level Descriptors

Level Descriptors describe in general terms the expected outcomes you will achieve at each level of study as you progress through your programmes. They describe the relative demand, complexity, depth of learning and learner autonomy associated with a particular level of learning and achievement. The University's Level Descriptors are aligned to the national [Framework for Higher Education Qualifications](#) (FHEQ) and are a key mechanism for ensuring the academic standards of the University's provision.

At Level 6: (Usually Year 3 undergraduate), you will be able to demonstrate that you have the ability:

- To critically review, consolidate and extend a systematic and coherent body of knowledge.
- Critically evaluate concepts and evidence from a range of resources.

- Transfer and apply subject-specific, cognitive and transferable skills and problem solving strategies to a range of situations and to solve complex problems.
- Communicate solutions, arguments and ideas clearly and in a variety of forms.
- Exercise considerable judgement in a range of situations.
- Accept accountability for determining and achieving personal and group outcomes.
- Reflect critically and analytically on personal and work place experience in the light of recent scholarship and current statutory regulations.

### **Programme Outcomes – Knowledge and Understanding**

The programme provides opportunities for you to develop and demonstrate the following:

**K1.** Knowledge of complex scientific principles underpinning relevant technologies, and their evolution within the context of decommissioning & waste management

**K2.** Ability to apply and analyse a range of mathematical techniques necessary to support application of key principles within decommissioning & waste management

**K3.** Knowledge to enable the application and design of theoretical solutions to complex decommissioning & waste management real work scenarios

**K5.** Ability to critically review and analyse decommissioning & waste management problems and situations in order to bring about continuous improvement and increased efficiencies

**K6.** Ability to adapt and develop computer software to solve problems relevant to decommissioning & waste management

**K7.** Ability to apply and develop an innovative approach to adapting engineering and science technology to decommissioning & waste management

**K8.** Analytical thinking skills to undertake a design process when determining solutions according to customer and user needs

**K9.** Ability to produce unique decommissioning & waste management solutions to meet a specification through the use of design methodologies

**K10.** Ability to analyse, critically appraise and apply the results of research and information gathering to evaluate and to propose solutions to decommissioning & waste management problems

**K11.** Interact, support and manage relationships with relevant stakeholders whilst applying commercial and business acumen, business improvement, project management techniques relevant to the decommissioning & waste management industry

### **Programme Outcomes – Skills and other Attributes (including Employability Skills and Behaviours)**

The programme provides opportunities for you to develop and demonstrate the following:

**S1.** Ability to review, appraise, select and use relevant equipment, tools, processes, or products relating to decommissioning & waste management activities

**S2.** Analytical practice and development within a workshop and laboratory relevant to decommissioning & waste management

**S3.** Ability to analyse and review information from technical literature and other sources to support project and professional activities

**S4.** Ability to demonstrate professional behaviours and codes of conduct and utilise industry standards relevant to the nuclear industry

**S5.** Ability to analyse, record and draw conclusions from data and experimental evidence and manage the presentation of findings.

**S6.** An ability to analyse and apply complex theoretical concepts relating to decommissioning & waste management real work scenarios

**S7.** Creativity and innovation in both a practical and theoretical context relating to decommissioning & waste management problems

**S8.** Ability to manage the successful outcome of industrial projects.

**S9.** A logical approach to implementing methods of determining the root cause of problems and demonstrating knowledge of learning from experience (LFE) processes.

**S10.** Manage quality processes and procedures to ensure continuous improvement

**S11.** A professional approach to developing and writing technical reports that meet business requirements including the optimisation and continuous improvement of processes and services.

**S12.** Ability to analyse and apply the results of research and information gathering to evaluate and to propose solutions to a particular application.

### **External and Internal Reference Points**

The following Subject Benchmark Statements and other external and internal reference points have been used to inform the Programme Outcomes:

- The programme outcomes are referenced to the Degree Apprenticeship Standard for Nuclear Scientist and Nuclear Engineer (and also the related Assessment Plan)
- QAA Benchmark statements for Engineering (2015)
- Engineering Council's Accreditation of Higher Education Programmes (AHEP) in engineering, in line with the UK Standard for Professional Engineering Competence (UK-SPEC) – Competence Matrix for IEng and CEng
- Nuclear Engineer & Scientist Degree Apprenticeship Standard – Knowledge and Skills Competences
- Nuclear Institute – Nuclear Delta
- National College for Nuclear – Course Structure Guidance

### **Graduate Prospects**

The programmes meet the immediate demand for Technicians and Engineers in key skill shortage areas as identified within the Government Nuclear Skills Strategy paper. Technical skills at levels 4 to



6 are in short supply with a particular emphasis within the paper identifying requirements for:

Electrical Power Technicians and Engineers

Control & Automation Technicians/Engineers

Mechanical & Electrical Design Technicians/Engineers

Nuclear Clean-up Specialists

The programmes also address some of the technical skill requirements for current nuclear projects within the commissioning of new plants and technology to enable new and advanced decommissioning and infrastructure activities to take place whilst also dealing with legacy & future waste considerations. All of these projects require infrastructure development and general mechanical and electrical design work. Sellafield Sites Limited operates a very large facility within West Cumbria which includes a number of legacy buildings which require asset managed to ensure compliance to the NNI.

Decommissioning and waste management and Infrastructure development is key within the current strategy of the NDA and underpinning these areas are innovative scientific solutions at all levels. An additional theme is the need for safe working environments and sustainability through the continuous monitoring and evaluation of radioactive environments and safety cases. These programmes will support the sustainability of recruitment within the nuclear industry, particularly managing the requirement for staff who will have relevant Level 5-6 qualifications.

Therefore there are upskilling opportunities for employers and the scope for graduates to register with the Engineering Council and enhance their career opportunities both within their existing employment or for full time students to gain sustainable and well paid employment.

These unique courses of academic and work based elements have been designed to provide individuals who require higher education qualifications with an opportunity to study locally and also gain credit for real work activities.

## **Delivery Arrangements and Attendance**

The course will be delivered on a block basis which will provide an opportunity to undertake enhanced practical activities supporting technical theoretical delivery methods and embedding theoretical knowledge through experience, observation and reflection.

The programme will require PT students to attend 4 x 1 week blocks per semester in addition to attendance for relevant exams during the designated exam week.

It is not intended for a module to be delivered in a single week block but for all modules in the specific semester to be delivered in parallel through the 4 weeks. Each block will have a total delivery period of 32 hours. An indicative delivery schedule is provided below relating to Semester 1 of the programme.

### **BSc Honours Decommissioning & Waste Management**

Block 1 – 15<sup>th</sup> January

Block 2 – 12<sup>th</sup> February

Block 3 – 12<sup>th</sup> March

Block 4 – 16<sup>th</sup> April



Each block in semester 1 will have the following delivery hours

Professional Development (20 credits – 2 semesters) 8 hours

Radioactive Waste Storage & Environmental Impact (20 credits) 16 hours

Radiological Measurement & Laboratory (10 credits) 8 hours

The ethos of this programme is to prepare and enhance the students' ability to work within the industry in terms of knowledge, skills and behaviours. The course has therefore been designed to fit with this strategy and has been structured to provide a natural means of embedding 'Experiential Learning' where appropriate into the curriculum in terms of content, delivery and assessment.

Refer to **Appendix 1** for further information on apprenticeship delivery models

### **Learning, Teaching and Assessment Strategies employed to enable the Programme Outcomes to be Achieved and Demonstrated**

The ethos of this programme is to prepare and enhance the students' ability to work within the industry in terms of knowledge, skills and behaviours. The course has therefore been designed to fit with this strategy and has been structured to provide a natural means of embedding 'Experiential Learning' where appropriate into the curriculum in terms of content, delivery and assessment.

The programme of teaching and learning is designed to enable the student to demonstrate the attainment of the stated learning outcomes of the programme and assessment strategies are as such matched to these outcomes. The student will be supported in a progressive acquisition of subject knowledge and skills, gradually advancing towards more independent learning whilst developing a reflective approach to personal progress.

Elements of experiential learning will support students in applying their knowledge and conceptual understanding to real-world problems or situations where the lecturer directs and facilitates learning. Classroom, laboratory and virtual reality facilities will serve as a setting for embedding activities such as case and problem-based studies, guided inquiry, simulations, experiments and projects.

The students will be given opportunities to learn in authentic situations which will make learning becomes more powerful.

By engaging in formal, guided, authentic, real-world experiences the programme will enable the students to:

- deepen their knowledge through acting and then reflecting on this action
- develop skills through practical application and reflection
- support the construction of new understandings when placed in novel situations
- extend their learning as they bring their learning back to the academic classroom environment

Students will be provided with opportunities for practice and feedback, this process of practice and feedback provides a link to 'learn from experience' which is an important behavioural requirement of the nuclear industry. The programme will provide an integration of:

- Knowledge — the concepts, facts, and information acquired through formal learning and past experience
- Activities — the application of knowledge to "real work" scenarios where appropriate and the

synergetic integration of work based activities with academic studies

- Reflection—the analysis and synthesis of knowledge and activity to create new knowledge  
Content and assessment will provide students with experiences that are carefully chosen for their learning potential (i.e. whether they provide opportunities for students to practice and deepen emergent skills, encounter novel and unpredictable situations that support new learning, or learn from natural consequences, mistakes, and successes).
- Throughout the programme, the learner will be actively engaged in posing questions, investigating, experimenting, being curious, solving problems, assuming responsibility, being creative, and constructing meaning, and is challenged to take initiative, make decisions and be accountable for results.
- The programme will provide the opportunities for reflection on learning during and after experiences and this will be an integral component of the learning outcomes. This approach will lead the student to be able to analyse, apply critical thinking, and synthesise.
- The programme will engage the learners intellectually, emotionally and/or physically, which produces a perception that the learning taking place is authentic.
- The programme will promote real work type relationships and will promote communications between the students and peers, management and other stakeholders.
- The programme will have an embedded culture of safety

The Lakes Colleges West Cumbria Teaching, Learning and Assessment Strategy has been developed in line with the University's Learning, Teaching and Assessment Strategy 2017-22.

College based learning is the predominant experience with attendance at all scheduled sessions seen as imperative to student progression. This is further enhanced by the use of 'virtual learning environments' (VLE) for example Moodle where each module studied has a designated Moodle site providing not only standard lecture and practical material but supplementary reading, virtual exercises and the capacity for online forums. The utilisation of VLE allows for flexibility in learning whereby materials may be accessed at an individual's convenience on site or via remote access.

In addition to the experiential experience previously discussed, a variety of other learning and teaching methods will be used to both reflect the variety of learning styles that inevitably exist within a group and ensure the acquisition and development of appropriate concepts, knowledge and skills. This will enable students to experience teaching methods best suited to their own preferred learning style. As previously identified, work readiness is key to this programme and enhancing employability is a core theme throughout the programme. Therefore the learning and teaching methods are designed to support the move to autonomy and independent learning. Learners are expected and encouraged to be reflective in their learning and as such the strategies adopted focus on deep and experiential learning and typically include:

- Lectures
- laboratory classes and virtual reality experiences
- individual and group tutorials
- the utilisation of case studies
- seminars and workshops

- directed and independent study involving electronic resources (VLE), textbooks and other self-study materials
- problem-based learning
- training and practice in the use of IT and software packages
- project work, both individually and in teams
- reading and interpreting research publications

#### Assessment Strategy

The assessment strategy has been developed to be in line with the University's Learning, Teaching and Assessment Strategy 2017-22.

The main drivers of this strategy are to:

- provide innovative, challenging and stimulating assessment which will enable you to develop the knowledge and professional skills required for employment.
- be student-centred, flexible and modern in both content and approach.
- be fully supported by, and integrated with technological approaches such as the Moodle virtual learning environment (VLE).
- impart academic rigour to the teaching and learning processes.
- support the development of independence, autonomy and self-reflection.
- support learners' needs at different stages of development.

Within a balanced scheme, assessment methods may include:

- unseen examinations
- laboratory reports
- computer-based assessments
- problem solving exercises (both of a practical and written format)
- analyse case studies to demonstrate knowledge and understanding
- oral, audio-visual and poster presentations
- peer and self-assessment
- group work

Formative assessment is also used extensively throughout the programme for and as learning. Whilst elements of assessment will test knowledge and ability, the emphasis is on a more developmental approach to building the knowledge and skills utilised within employment. Formative assessment will involve the student being actively engaged in the assessment to encourage them to think about the learning process, to develop an ability to learn independently and to develop employability skills. It

will also be used to evaluate teaching.

Personal development and reflective practice will take place throughout the programme and will be implemented through the wide range of activities (both formative and summative) as well as via the personal tutorial process.

An important aspect of this higher education programme is the development of the student's independence and ability to learn from experience (LFE), which is a key behavioural requirement of the nuclear industry. These skills will be developed through project work, investigative practical work and portfolio building with reflective analysis. This reflective analysis and associated experiences will also develop critical thinking thought processes with some assessment requiring students to summarise their work with a critical review of their experience.

## **End Point Assessment**

The College and the employer are bound by contract to work together to support the apprentice and to carry out the end-point assessment with the University as the end-point assessor (EPA). In accordance with the Apprenticeship Standard, the final year dissertation provides the end-point assessment for the Degree Apprenticeship. Both the project outcomes and the associated presentation will be assessed. The project is work-based, is chosen in conjunction with the employer, and is assessed jointly by the EPA and the employer.

## **Student Support**

### **Learning Mentor System**

You will be allocated a Learning Mentor to provide pastoral guidance both directly or and in liaison with subject tutors, the course leader or through study support.

The Learning Mentor will arrange interviews/tutorials at certain times through the year to discuss your progress on the course or concerns about the course in general. The aim of a tutorial session is to identify any underlying reasons for the concerns, discuss possible solutions and agree how progress can be facilitated. It is intended to be a positive and structured forum for any concerns to be discussed and resolutions identified. You are encouraged to initiate a tutorial if you feel that you require assistance in some way. The process provides a collaborative approach between the tutor, yourself and other Services.

During the tutorial, you and the tutor may also explore the range of support mechanisms in place both internally and externally, such as academic skills assistance, counselling and medical support for example.

### **Learning Resource Centre (LRC) and Student Services**

Library and Student Services (LRC) offer a wide range of support, including; access to library learning resources, academic skills, careers and employability, financial help, counselling, health and wellbeing and support for disabled students and those with specific learning requirements. We know that you want to get the most out of your programme, make the best use of your time and find or continue in the career you always dreamed of.

Module leaders will collaborate with LRC advisers to ensure that your reading lists are current and

items are available via the library collections. In order to maximise access, availability and usefulness, ebooks and electronic journal titles will, in most cases, be prioritised. Where appropriate, module reading lists will be made available to you electronically using the College's Moodle pages.

### **Course Representatives**

Course representatives are invited to attend Course Team Meetings and other similar meetings to discuss any issues of concern in order to improve the quality of the teaching and to enhance your learning experience. One course representative from all the HE courses can be elected as a learner governor on the governing body of the College.

### **Employability**

Lakes College aims to deliver accessible, flexible and quality assured programmes that provide academic inspiration and challenge, and support excellence. The courses are designed with a strong vocational focus and emphasis is given to the development of core professional and transferable skills to enhance employability.

As such, a wide range of transferable skills are covered. These include:

- Communication
- Group work
- Problem solving

Use of information technology

### **Support in your Workplace & Apprenticeship Liaison Tutor**

At your workplace, you will be supported by your employer. Exact arrangements and terminology are the responsibility of the employer, but typically, you will be supported as follows, where the roles may be combined in one person;

- A Mentor designated by the employer to provide vocational and pastoral support for individual students, who may or may not be your line manager. In particular support will be provided for work-based learning assignments, portfolio and the final year project.
- An Employer Apprenticeship Liaison Manager who manages the relationship between the programme (via the College Liaison Tutor) and the employer

The College and the employer are bound by contract to work together to support you as an apprentice. This will include quarterly meetings between the College, the student, and the employer.

The Level 6 standard has been designed to take up to a maximum of 60 months to complete (5 years). There are three possible methodologies of delivering these two standards:

- The first is registering the Apprentices on to the Level 6 Degree Apprenticeship in Year 1. This means that the Apprentices will have to complete the full 5 years and will not be able to stop at the end of the Foundation Degree.
- The second is the 3+2 method. This method requires the Apprentices to be registered onto the Level 5 Apprenticeship when they start their Foundation Degree. Once they have passed the Foundation Degree and have passed the Level 5 Apprenticeship (3 years), they will then, if they wish, progress on to the Level 6 Apprenticeship and the Bachelor's Degree (2 years). This enables the Apprentices to make the choice at the end of their Foundation Degree, whether or not they would like to continue onto the Bachelor's Degree.

- The third is method is for Apprentices that have met the entry requirements to access the Bachelor's Degree directly. They will be registered on to the Level 6 Apprenticeship and will have 2 years to complete their Apprenticeship.

The methods that we will be employing at Lakes College are the second and third methodologies.

The assessment methodology for both of these standards are as laid out below.

### **Additional Support for Students Transferring from an Academic Programme to the Degree Apprenticeship**

A gap analysis will be undertaken for students transferring directly from an academic programme in to the degree apprenticeship level 6 standard. This analysis will determine the contents of a development plan to ensure that the learner is given the work based or work simulated opportunities to generate evidence mapped to the identified competence gaps. The Academic Lead for Level 5 and 6 Apprenticeships will meet with the learner and new employer on a monthly basis (as an addition to the normal review process) to update the development plan and make adjustments as and if required.

### **Student Support Between Block Release**

Between block delivery students will have access to a range of additional support mechanisms which will include:

- Access to a virtual learning environment with supporting learning materials for each module which will include; case study materials, practice examples, interactive tests, discussion board and direct access to the module tutor via an online share point.
- Access to the lakes College Learning Resource Centre which is open till 9.30 pm (Monday to Thursday) and the specialist HE Section for quiet study within the LRC.
- Drop in seminar sessions within the National College for Nuclear facility
- Timetabled drop in Maths support sessions once per week
- An employer mentoring system will be supported where appropriate
- Each student will have direct access on a daily basis to the Academic Lead for level 5 and 6 apprenticeships

### **Level 6 – Nuclear Engineer/Scientist**

The Level 6 standard has been broken down into two main components; Knowledge & Skills and Behaviours. There are 27 competencies in total with 15 being Knowledge and Skills based and 12 being Behavioural. The Apprentices are required to build a portfolio of evidence against the 27 competencies over the 2 years of the Apprenticeship, which falls in line with the 2 years taken to complete the Bachelor's Degree (as discussed at the beginning of this document).

The portfolio will be made up of a number of technical reports, of a set format, in which the Apprentices will describe how they meet each of the standards. These reports will be a chance for the Apprentices to reflect on the work that they have undertaken in the workplace and to discuss how their experiences help them to meet the requirements of the standard. The 28 competencies are identified below as well as how they will be assessed within the EPA process.

Ref	Knowledge and Skills Competencies
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<b>6SK1</b>	Work competently in a technical nuclear environment, understand and promote personal responsibility for Health, Safety, Radiation Protection, Environmental Protection, Quality, Security, Safeguards and principles of Risk Management.
<b>6SK2</b>	Analyse engineering and scientific problems selecting and using mathematical, engineering and scientific tools to provide suitable solutions to nuclear applications, with considerations of the entire life cycle of a nuclear facility.
<b>6SK3</b>	Develop and critically apply knowledge of the concepts, principles and theories of engineering science relevant to the interdisciplinary fields of nuclear technology.
<b>6SK4</b>	Demonstrate an understanding of stakeholder requirements, commercial awareness, business improvement, project and business management techniques relevant to the nuclear industry.
<b>6SK5</b>	Apply knowledge of a variety of technologies utilised within the nuclear industry through the application of relevant disciplines such as reactor physics, nuclear materials, electrical systems, mechanical and process plant systems, measurement and control engineering, chemical engineering and process engineering.
<b>6SK6</b>	Specify, plan, manage, conduct and report on nuclear projects.
<b>6SK7</b>	Synthesise information from a variety of sources and apply to the solution of a particular nuclear technology application.
<b>6SK8</b>	Accurately observe, record and draw conclusions from data and experimental evidence, recognising inherent uncertainties and limitations.
<b>6SK9</b>	Apply design processes including materials selection that meet nuclear industry standards.
<b>6SK10</b>	Demonstrate an understanding of Regulatory requirements both national and international.
<b>6SK11</b>	Develop technical reports that meet requirements of the prevailing verification process.
<b>6SK12</b>	Demonstrate knowledge of the nuclear industry (past, present and future) and the business, political and community environment in which the company operates including personal role within the organisation, ethical practice and codes of conduct.
<b>6SK13</b>	Demonstrate an understanding of root cause analysis and learning from experience (LFE) processes.
<b>6SK14</b>	Demonstrate knowledge of the technology, safety, environmental and economics of nuclear fuels and the nuclear fuel cycle.
<b>6SK15</b>	Apply the standards for nuclear professional practice as required by the industry and professional body institutions.

<b>Ref</b>	<b>Behavioural Competencies</b>
<b>6B1</b>	Communicate effectively and appropriately using a full range of skills; technical speaking to a scientific/ engineering audience, active listening, professional writing, professional body language, technical presentation.
<b>6B2</b>	Demonstrate reliability, integrity and respect for confidentiality on work related and personal matters.
<b>6B3</b>	Work autonomously and interact effectively within a wide, multi-disciplinary project team.
<b>6B4</b>	Understand the impact of work on others, especially where related to diversity and equality.
<b>6B5</b>	Manage time effectively, being able to plan and complete work to schedule.
<b>6B6</b>	Demonstrate a supportive attitude to change and respond positively to change management processes.
<b>6B7</b>	Take responsibility for personal development, demonstrating commitment to learning and self-improvement and be open to feedback.
<b>6B8</b>	Demonstrate a strong commitment to personal safety behaviours and understanding of the consequences as set out in the nuclear industry requirements.
<b>6B9</b>	Actively challenge unsafe practices and understand the relationship between nuclear, radiological and conventional safety and ensure this is reinforced in the workplace
<b>6B10</b>	Follow rules, procedures and principles to ensure work completed is fit for purpose and pay attention to detail and carry out error checks throughout work activities.



<b>6B11</b>	Demonstrate a commitment to sustainability in work design and application.
<b>6B12</b>	Be an enthusiastic advocate for the nuclear industry with the ability to represent this industry to a variety of audiences.

The Level 6 Apprenticeship is an integrated Degree Apprenticeship. This means that the Dissertation Which occurs in the 2<sup>nd</sup> year of the Bachelor's Degree is assessed for both the Degree and also the Apprenticeship via the End Point Assessment. To help the Apprentices develop their Portfolio, there has been a module included in the first year (semesters 1 and 2), called Professional Development. This along with the Dissertation, will allow the Apprentices to build a comprehensive Portfolio of evidence.

### **Professional Development (Year 1, Semester 1 and 2)**

This module will run for the whole of the first year across both semesters. The Learning Outcomes for this module have been linked to a number of the competencies (as listed below), which have been specifically selected for this module. This allows the work to be assessed as part of the Degree as well as count towards the Apprentice Portfolio, which is required for the End Point Assessment.

There will be a number of assessments throughout the year (twice a semester, dates to follow), in which the Apprentice will have to submit a report on a selected subject per assessment. An example of a report could be for the Apprentice to complete a critical review of their own Skills, Knowledge and Behaviours against the requirements of the Engineering/Science Council and also the Level 6 Degree Apprenticeship standards. This will enable them to identify any gaps in their competence and to come up with a strategy to fill those gaps. This report can then be used to help them write their project proposal for their dissertation and enable gaps to be filled, where necessary, with the Dissertation.

This will mean that the Apprentices will submit 4 comprehensive reports, which will help with their professional development, but also will help build up their Portfolio of evidence for their End Point Assessment.

Learning Outcome No.	Associated Competency	Learning Outcome No.	Associated Competency
1		5	
2		6	
3		7	
4		8	

### **Industrial Based Dissertation (Year 3, Semesters 1 and 2)**

This module will run through the whole of the 2<sup>nd</sup> year (semesters 1 and 2). The Learning Outcomes for this module have been linked to a number of the competencies (as listed below). The aim on this module is for the Apprentice to engage with, manage and critically analyse the impact of a major Work Based project from concept to conclusion. Using the knowledge and skills they have gained and the behaviours they have exhibited, the Apprentices must be able to demonstrate that they can manage and successfully deliver a complex nuclear project. They will do this by producing a project report (in the form of a Dissertation). In this report, the Apprentices are expected to be able to critically reflect on the successes and the problems that they encountered. They are also expected to provide evidence to show that they can successfully solve complex nuclear issues that may crop up within a major project.

Prior to starting the project, the Apprentices will produce a project proposal, in which they will describe what the project entails. This will allow the delivery team to assess whether or not the project has sufficient depth to cover the Learning Outcomes. If a project is assessed as not having enough depth to cover all of the Learning Objectives, the delivery team will work with the Apprentice to assess any

necessary additions to the project. However it is envisaged that the Apprentices will utilise their write ups from the Professional Development module to help them select a relevant and sufficient project.

Learning Outcome No.	Associated Competency	Learning Outcome No.	Associated Competency
1		5	
2		6	
3		7	
4		8	

## End Point Assessment

As per the Assessment Plan for the Level 6 Nuclear Engineer/Scientist Apprenticeship (**ST0289/AP02**), the End Point Assessment (EPA) will be in three stages:

### Stage 1

A Portfolio of evidence is produced by the Apprentice (over the course of the two years), which demonstrates the Apprentice's ability to meet the requirements of the broad range of knowledge, skills and behaviours set out in the Apprenticeship standard. The Apprentice will submit the Portfolio prior to a presentation and structured interview.

### Stage 2

#### Industrial Project – Dissertation and Viva

The Apprentice will have completed a major Plant based project and will have compiled an extensive Project Report (Dissertation). This will be handed in to the Delivery team to be assessed as part of the Industrial Project – Dissertation Module. A copy will also be sent to the Independent Assessor, who will be assessing the Apprentices against the Level 6 Apprenticeship standards. This gives the Independent Assessor a chance to read the project report prior to the Viva.

The Viva will be a presentation delivered by the Apprentice to the degree delivery team as part of the Industrial Project – Dissertation Module. The Independent Assessor will also attend the Viva and will be given the opportunity to ask some pertinent questions. By attending the Viva, it gives the Apprentice and the Independent Assessor a chance to meet prior to the interview (stage 3) and gives the Independent Assessor a chance to hear first-hand how the Project was delivered.

### Stage 3

An interview, consisting of a structured discussion supported by the Portfolio of evidence, the Dissertation and notes from the Viva. The result of the interview will be a Pass or Fail. This means that the Apprentice has either fully met the requirements of the Level 6 standards or they have not met the requirements to an acceptable standard. If the Apprentice fails the interview, they will need to re-submit their Portfolio of evidence as per the advice from the University of Cumbria.

## 1. Portfolio of Evidence

The Portfolio is a key component of the EPA and therefore is essential in enabling the Apprentice to demonstrate the achievement of the competencies identified in Competency tables 4 and 5. A guidance document based on a clearly defined structure of the Portfolio will be given to the Apprentices as an advice document by the University of Cumbria.

The Portfolio will be a series of ordered and critical accounts of the achievement of the technical competencies identified in tables 4 and 5.

The Portfolio must demonstrate the Apprentice's knowledge and experience and how this achieves the

requirements of the Level 6 standards.

It is envisaged that the Apprentices will write a technical report for each of the competencies and the 27 reports will then form their Portfolio as well as their Dissertation.

## **2. Dissertation + Viva**

The Dissertation will be compiled by the Apprentice as per the Module Descriptor. This will be handed in as per the assessment hand in dates supplied by the degree delivery team. The Learning Outcomes of the Industrial Project – Dissertation Module have been written to incorporate the Level 6 standards. This means that whilst completing this module, they are also generating evidence for their Portfolio. The Independent Assessor will receive a copy when the Apprentices hand in their completed Dissertation to the Degree delivery team. This will give them time to read through the Dissertation and prepare themselves for the Viva.

The Viva will be pre-organised between the Apprentices and the Degree delivery team. The Viva will be no longer than 20 minutes, followed by a question and answer session with the attendees. The Viva provides the Apprentice with an opportunity to elaborate on key points but also provides the Apprentice the opportunity to demonstrate further knowledge and skills for clearly defined competencies.

The presentation will form part of the overall mark allocated to the Module. The Apprentices will be informed prior to the presentation that questions from the presentation may be taken forward to the interview by the Independent Assessor for clarification.

## **3. Interview**

The interview panel will consist of the designated independent end point assessor and an independent technical expert provided by the employer. A guidance document will be given to the Apprentice detailing the purpose and structure of the interview by the University of Cumbria. The interview will provide the Apprentice with an opportunity to demonstrate evidence of competence against the competencies identified within the Competency tables 4 and 5.

The purpose of the interview is to confirm that the Apprentice has demonstrated the requirements of all of the Competencies as identified in tables 4 and 5 and thus will be identified as being competent.

The panel will use elements of the Portfolio, Dissertation and the Viva as an agenda for the interview and will encourage the Apprentice to talk about their experience, drawing out evidence of competence during the discussion.

The outcome of the interview will either be a Pass or a Fail. The outcome will be deemed a fail if the interview panel do not think the Apprentice has provided enough evidence to prove their competence. If the outcome is a fail, then the panel will give the Apprentice detailed feedback with regards to the Competencies that they feel needs more/improved evidence. The Apprentice will then have a set period of time (time will be dependent on the number of omissions) to collate extra evidence and make changes to the relevant areas of their Portfolio. These amendments will then be resubmitted to the Independent Assessor and the Apprentice will be invited to another Interview to clarify the changes.

<b>Programme Curriculum Map</b>						
<b>Academic Level</b>	<b>Module Code</b>	<b>Module Title</b>	<b>Credits</b>	<b>Module Status*</b>	<b>Programme Outcomes achieved</b>	<b>Apprenticeship Standards achieved (see Appendix 2)</b>
6	NUCL6000	Professional Development	20	Core	K3, K5, K11, S3, S4, S9, S10, S11	6SK2, 6SK3, 6SK4, 6SK11, 6SK12, 6B1, 6B2, 6B3, 6B4, 6B5, 6B6, 6B7, 6B8, 6B9, 6B10, 6B11, 6B12
6	NUCL6013	Industrial Based Dissertation	40	Core	K1, K2, K3, K4, K5, K6, K7, K8, K10, K11, S1, S3, S4, S5, S6, S7, S8, S9, S11, S12	6SK2, 6SK3, 6SK4, 6SK5, 6SK7, 6SK8, 6SK11, 6SK12, 6SK13, 6SK14, 6SK15, 6B1, 6B3, 6B5, 6B10
6	NUCL6001	Radioactive Waste Storage & Environmental Impact	20	Compulsory	K1, K2, K3, K10, S1, S2, S5, S6, S7, S12	6SK2, 6SK3, 6SK5, 6SK7, 6SK8, 6SK11
6	NUCL6002	Radiological Measurement & Laboratory	10	Compulsory	K1, K2, K3, K4, K5, K6, K7, K8	6SK2, 6SK3, 6SK5, 6SK7, 6SK8, 6SK11
6	NUCL6003	Project Management in Nuclear	10	Compulsory	K1, K2, K3, K4, K5, K6, K7, K8	6SK1, 6SK4, 6SK6, 6SK9, 6SK10, 6SK11, 6B1, 6B3, 6B5, 6B6
6	NUCL6004	Robotic Systems, Configuration & Programming	20	Compulsory	K1, K2, K4, K5, K6, S1, S2	6SK2, 6SK3, 6SK5, 6SK7, 6SK8, 6SK11
<b>Notes</b>						
<p>This programme operates in accordance with the University's Academic Regulations and Academic Procedures and Processes.</p> <p>As specified by the Degree Apprenticeship Assessment Plan, for an award with Honours and hence a Degree Apprenticeship, a student cannot be condoned for the final year project module.</p>						

In accordance with the Degree Apprenticeship Assessment Plan, for an award with Honours and hence a Degree Apprenticeship, students must maintain a portfolio of their completed work to demonstrate their achievements and capabilities. It consists of the practical output of all assessments completed during the programme, including the final project report and presentation (if applicable). Since the outputs within the portfolio have already been assessed, no further assessment will take place on the portfolio, but to gain an Honours award the portfolio must be maintained.

**\* Key to Module Statuses**

Core Modules	Must be taken and must be successfully passed
Compulsory Modules	Must be taken although it may possible to carry as a marginal fail (if the award permits)

## Programme Delivery Structure: Part Time

Module Code	Module Title	Delivery Pattern	Method(s) of Assessment	Approximate Assessment Deadline
		Spring Semester 1 / Autumn Semester 2 / Extended / Year-Long		
NUCL6000	Professional Development	Year 1 - Year long	2 x Course Works	March, December
NUCL6013	Industrial Based Dissertation	Year 2 – year long	VIVA, Report	November, December
NUCL6001	Radioactive Waste Storage & Environmental Impact	Year 1 - Spring	Course Work, Exam	February, May
NUCL6002	Radiological Measurement & Laboratory	Year 1 - Spring	2 x course works	March, May
NUCL6003	Project Management in Nuclear	Year 1 - Autumn	Course Work, Project	October, December
NUCL6004	Robotic Systems, Configuration & Programming	Year 1 - Autumn	Course Work, Exam	November, December

**Programme Delivery Structure: Full Time**

Module Code	Module Title	Delivery Pattern	Method(s) of Assessment	Approximate Assessment Deadline
		Spring Semester 1 / Autumn Semester 2 / Extended / Year-Long		
NUCL6000	Professional Development	Year 1 - Year long	2 x Course Works	March, December
NUCL6013	Industrial Based Dissertation	Year 2 – year long	VIVA, Report	November, December
NUCL6001	Radioactive Waste Storage & Environmental Impact	Year 1 - Spring	Course Work, Exam	February, May
NUCL6002	Radiological Measurement & Laboratory	Year 1 - Spring	2 x course works	March, May
NUCL6003	Project Management in Nuclear	Year 1 - Autumn	Course Work, Project	October, December
NUCL6004	Robotic Systems, Configuration & Programming	Year 1 - Autumn	Course Work, Exam	November, December

**Students exiting at this point with 120 credits would receive an BSc Honours Decommissioning & Waste Management**



<b>Methods for Evaluating and Improving the Quality and Standards of Learning</b>	
<b>Mechanisms used for the Review and Evaluation of the Curriculum and Learning, Teaching and Assessment Methods</b>	<ul style="list-style-type: none"> <li>• Module Evaluation</li> <li>• Programme Validation and Periodic Review</li> <li>• Annual Monitoring</li> <li>• Peer Review of Teaching</li> <li>• External Examiner Reports</li> <li>• Student Success and Quality Assurance Committee</li> <li>• Internal Lakes College review meetings</li> </ul>
<b>Mechanisms used for gaining and responding to feedback on the quality of teaching and the learning experience – gained from: Students, graduates, employers, placement and work-based learning providers, other stakeholders, etc.</b>	<ul style="list-style-type: none"> <li>• Staff Student Liaison Meetings</li> <li>• Module Evaluation Forms</li> <li>• Programme Evaluation</li> <li>• Module/Programme/Personal tutorials</li> <li>• Meetings with External Examiners</li> </ul>

<b>Date of Programme Specification Production:</b>	June 2017
<b>Date Programme Specification was last updated:</b>	
<b>For further information about this programme, refer to the programme page on the College website</b>	

## **Appendix 1**

### **Apprenticeship delivery structure**

Apprenticeship programmes are designed to be offered for part-time study with delivery at the College. However, as a Degree Apprenticeship, other types of flexible delivery may be required. Hence this specification distinguishes between:

- 1) The Curriculum Map, which consists of:
  - the modules including the level, delivery mode (e.g. face to face or blended learning), and delivery activities (e.g. lectures, guided independent study);
  - the designation of modules as core, compulsory, or optional
  
- 2) The Programme Delivery Structure, which consists of:
  - the semester(s) in which each module is delivered
  - the delivery method for each module (e.g. block release or day release)
  - the method of assessment and indicative assessment deadline(s)

This programme can be made available in two modes of study:

- a) Standard Mode of Study:
  - the initial offer by the College: with the defined curriculum map and programme delivery structure
  - flexible duration of 3, 4 or 5 years
  - delivered part-time through a mix of day release and block release across all three semesters
  - with a cohort open to all employers.
  
- b) Custom Mode of Study:
  - determined by negotiation with a particular employer or delivery partner: following the defined curriculum map, but with a bespoke programme delivery structure, not defined in this specification.

## **Appendix 2**

### **Apprenticeship Standards to which the Curriculum Map refers**

Apprenticeship Standard and Assessment Plan for a Nuclear Scientist and Nuclear Engineer –

<https://www.gov.uk/government/publications/apprenticeship-standard-nuclear-scientist-and-nuclear-engineer>