Programme Specification

Programme Title and Name of Award	HND Mechanical Engineering		
Academic Level	5	**Total Credits**	120
Professional Qualifications / Accreditation	Accreditation at Engineering Technician Level (EngTech) and partial Incorporated Engineer (IEng) will be sought from the Institution of Mechanical Engineers (IMechE) and the Institute of Engineering Technology (IET)		
Date of Professional Body Accreditation	Pending	**Accreditation Period**	TBC
UCAS Code	Not applicable		
Programme Externally Accredited by:	Delivered under licence from Pearson		
JACS Code			
HECoS Code	100190		
Criteria for Admission to the Programme	The University's standard criteria for admissions apply. Please refer to the Applicant Information pages of the University website for more information. For APL, please refer to the University website. All students will be interviewed to assess their suitability for the course. The entry qualification for the HND will be a HNC in Mechanical Engineering with a suitable profile. .		
Teaching Institution	Lakes College West Cumbria		
Owning Department	Institute of Business, Industry and Leadership		
Programme delivered in conjunction with	N/A		
Principal Mode of Delivery	Face to Face		

Pattern of Delivery	Part Time – Full Time
Delivery Site(s)	Lakes College West Cumbria and the National College for Nuclear
Programme Length	Full Time Standard Registration Period – 1 year Part Time Standard Registration Period – 1.5 years Maximum Registration Period – 6 years
Higher Education Achievement Report (HEAR)	Upon successful completion of this programme, you may receive a Diploma Supplement/Higher Education Achievement Report (HEAR).
Exit Awards	Not applicable
Period of Approval	TBC

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
- Self-reliant, adaptable and flexible
- Confident in your discipline as it develops and changes over time
- Capable of working across disciplines and working well with others
- Confident in your digital capabilities
- Able to manage your own professional and personal development
- 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
- Ambitious and proud

Programme Features

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. In addition, the Higher National Diploma has been designed to provide a seem less progression pathway to the BEng Honours in Mechanical Engineering.

This programme is part of a suite of higher education programmes which have been developed to meet the need for Engineers as identified within the Governments Nuclear Skills Strategy Document and sanctioned by the National Curriculum & Qualification Advisory Group for Nuclear (CQAG).

The programme has been designed to provide a unique learning experience. 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, college engineering laboratories supported by a virtual reality suite which will provide the students with a real time immersed experience of mechanical models.

The course will be delivered on a day release 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 work based module and a project. These modules provide an opportunity to further embed experiential learning within an industrial context.

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 mechanical engineering using a range of learning strategies
2. To provide students with an experience of higher education that reflects the requirements for innovation and the range of activities that will occur within the mechanical engineering industry.
3. To encourage and develop observation, reasoning, reflection and analytical thinking powers to enable the embedding of work ready behaviours which are essential to mechanical engineering environments
4. To inculcate work-related and transferable skills through experiencing real work scenarios
5. To provide opportunity for the development and expression of creative and innovative thought when designing within mechanical engineering activities
6. To provide graduates with technical knowledge and skills that will prepare them to be work ready and practice mechanical engineering as an individual
7. To enable graduates to work and communicate efficiently within a team and a varied audience when applying mechanical engineering skills

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 5: (Usually Year 2 undergraduate), you will be able to demonstrate that you have the ability:

- To apply and evaluate key concepts and theories within and outside the context in which they were first studied.
- Select appropriately from and deploy a range of subject-specific, cognitive and transferable skills and problem solving strategies to problems in the field of study and in the generation of ideas effectively communicate information and arguments in a variety of forms.

Programme Outcomes – Knowledge and Understanding

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

After 120 credits of study you will be able to demonstrate:

K1. Knowledge of the scientific principles underpinning relevant technologies, and their evolution within the context of mechanical engineering

K2. Ability to apply a range of mathematical techniques necessary to support application of key principles within mechanical engineering

K3. Knowledge to enable the application of theoretical mechanical engineering concepts to a real work scenario

K4. Ability to monitor, interpret and apply the results of analyses and modelling in order to bring about continuous improvement within mechanical engineering

K5. Ability to apply quantitative methods and computer software relevant to mechanical engineering, frequently within a multidisciplinary context.

K6. Ability to apply a systems approach to engineering problems through know-how of the application of the relevant mechanical engineering technologies

K7. Analytical thinking skills to undertake a design process when determining solutions according to customer and user needs

K8. Ability to adapt civil engineering & asset management designs to meet their new purposes or applications

K9. Ability to analyse and apply the results of research and information gathering to evaluate and to propose solutions to particular mechanical engineering applications

K10. Awareness of relevant stakeholders, commercial and business acumen, business improvement, project management techniques relevant to the mechanical engineering industry

Programme Outcomes – Skills and other Attributes (including Employability Skills)

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

After 120 credits of study you will be able to demonstrate:

S1. Ability to use relevant equipment, tools, processes, or products relating to mechanical engineering

S2. Practical skills within a workshop and laboratory relevant to mechanical engineering

S3. Ability to use and apply information from technical literature and other sources to support project and work based activities

S4. Ability to apply appropriate codes of practice and industry standards relevant to mechanical engineering

S5. Ability to observe record and draw conclusions from data and experimental evidence and presentation of findings under supervision.

S6. An ability to apply theoretical concepts of mechanical engineering systems to real work scenarios

S7. Creativity and innovation in a practical context relating to mechanical engineering

S8. Ability to engage and support 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. Awareness of quality issues and their application to 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 mechanical engineering applications.

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:

QAA Benchmark statements for Engineering (October 2019)

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 EngTech and IEng

National College for Nuclear – Course Structure Guidance

The Programme content has also been mapped to the mandatory content of the Pearson HND Mechanical Engineering.

Graduate Prospects

The Higher National Diploma meets the immediate demand for Technicians in key skill shortage areas as identified within the Government Skills Strategy paper. Technical skills at level 4 are in short supply with a particular emphasis within the paper identifying requirements for:

Mechanical Maintenance Technicians

Mechanical Design Technicians

Operations Technicians

Maintenance Team Managers

Engineering Project Technicians

The programmes also address some of the technical skill requirements for projects within the operations, maintenance and commissioning of new systems and plants and technology. All of these projects require infrastructure development and general mechanical design work.

There are upskilling opportunities for employers and there is 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.

This course 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.

The Higher National Diploma also provides an opportunity to progress to the Higher National Diploma in Mechanical Engineering.

The HND also addresses the QAA Benchmark statements for Engineering (October 2019).

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 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 Canvas where each module studied has a designated Canvas 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. 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 Canvas 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.

Work based modules including the work based project are integral components of the foundation degree. They give opportunities for PT employed students to integrate work activities and projects into the degree and enable a range of work related activities to be discussed in the group tutorial sessions. The work based modules are designed provide a synergetic integration of academic modules and industrial practice. All employed PT students will utilise their work experience supported by a dedicated training advisor who will be on hand to offer advice and support.

FT students will also undertake the work based module. Placements will be considered during the holiday periods of the HND programme and if required opportunities to undertake highly relevant industrial scenario work within the project centres at Lakes College West Cumbria. These scenarios will address the learning outcome requirements of the work based module whilst also providing students with a realistic industrial experience. All placements will be supported by the dedicated training advisor within the department.

Student Support

Induction

All students including part time students will undertake a thorough induction. The induction process and procedure – 'Procedure: Learner Induction - Procedure Ref: OP/8GS/SP112' can be found under student support on the Canvas VLE.

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 Canvas 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

Programme Curriculum Map					
Academic Level	**Module Code**	**Module Title**	**Credits**	**Module Status***	**Programme Outcomes achieved**
5	NUCL5000	Mathematics Methods A	10	Core	K2, K5, K6
5	NUCL5027	Professional Engineering Management	20	Core	K1, K2, K4, K6, S1, S2
5	NUCL5029	Research Project	20	Core	K1, K3, S2, S4
5	NUCL5023	Dynamic Engineering Systems	10	Compulsory	K1, K3, S2, S4
5	NUCL5001	Mathematical Methods B	10	Core	K2, K5, K6
5	NUCL5024	Mechanical Power Transmission	10	Compulsory	K3, K4, S3, S4, S5, S6
5	NUCL5030	Static Engineering Systems	10	Compulsory	K1, K2, K4, K6, S1, S2
5	NUCL5021	Advanced Engineering Thermo-Fluids	20	Compulsory	K1, K2, K4, K5, K6, S1, S2
5	NUCL5025	Mechatronics	10	Compulsory	K1, K2, K4, K6, S1, S2
Notes					
This programme operates in accordance with the University's Academic Regulations and Academic Procedures and Processes					

* **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)

Notes
This programme operates in accordance with the University's Academic Regulations and Academic Procedures and Processes. A failed student will not be permitted to re-register on the same programme. There are no prerequisite module requirements, all modules can be taken on a standalone basis. There are no optional modules and there is a single named pathway.

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		
NUCL5000	Mathematical Methods A	Year 1 – Spring	Course Work, Exam	October, January
NUCL5027	Professional Engineering Management	Year 2 – Spring		May
NUCL5029	Research Project	Year 2 – Spring	Course Work	May
NUCL5023	Dynamic Engineering Systems	Year 1 – Autumn		November, January
NUCL5001	Mathematical Methods B	Year 1 – Autumn	1 x Course Work, Exam	November, January
NUCL5024	Mechanical Power Transmission	Year 1 – Autumn	2 x Course Works	October, December
NUCL5030	Static Engineering Systems	Year 1 – Spring	1 x Course Work, Exam	March, May
NUCL5021	Advanced Engineering Thermo-Fluids	Year 1 – Spring	2 x Course Works	April, May
NUCL5025	Mechatronics	Year 1 - Autumn	2 x Course Works	October, January
Students exiting at this point with 120 credits would receive a Higher National Diploma Mechanical Engineering				

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		
NUCL5000	Mathematical Methods A	Year 1 – Spring	Course Work, Exam	March, May
NUCL5	Professional Engineering Management	Year 1 – Autumn		January
NUCL5	Research Project	Year 1 – Autumn	Course Work	January
NUCL5	Dynamic Engineering Systems	Year 1 – Spring		April, May
NUCL5001	Mathematical Methods B	Year 1 – Autumn	1 x Course Work, Exam	November, January
NUCL5	Mechanical Power Transmission	Year 1 – Autumn	2 x Course Works	October, December

NUCL5	Static Engineering Systems	Year 1 – Spring	1 x Course Work, Exam	March, May
NUCL5	Advanced Engineering Thermo-Fluids	Year 1 – Spring	2 x Course Works	April, May
NUCL5	Mechatronics	Year 1 - Spring	2 x Course Works	October, January
Students exiting at this point with 120 credits would receive a Higher National Diploma in Mechanical Engineering				

Methods for Evaluating and Improving the Quality and Standards of Learning	
Mechanisms used for the Review and Evaluation of the Curriculum and Learning, Teaching and Assessment Methods	• Module Evaluation • Programme validation and revalidation • Annual Monitoring reports • Peer Review of Teaching • External Examiner Reports • Internal Lakes College review meetings
Mechanisms used for gaining and responding to feedback on the quality of teaching and the learning experience – gained from: Students, graduates, employers, WBL venues, other stakeholders, etc.	• Staff Student Liaison Meetings • Module Evaluation Forms • Programme Evaluation: National Student Survey, Penultimate Year Survey • Module/Programme/Personal tutorials • Meetings with External Examiners

Date of Programme Specification Production:	September 2019
Date Programme Specification was last updated:	
For further information about this programme, refer to the programme page on the Lakes College website	