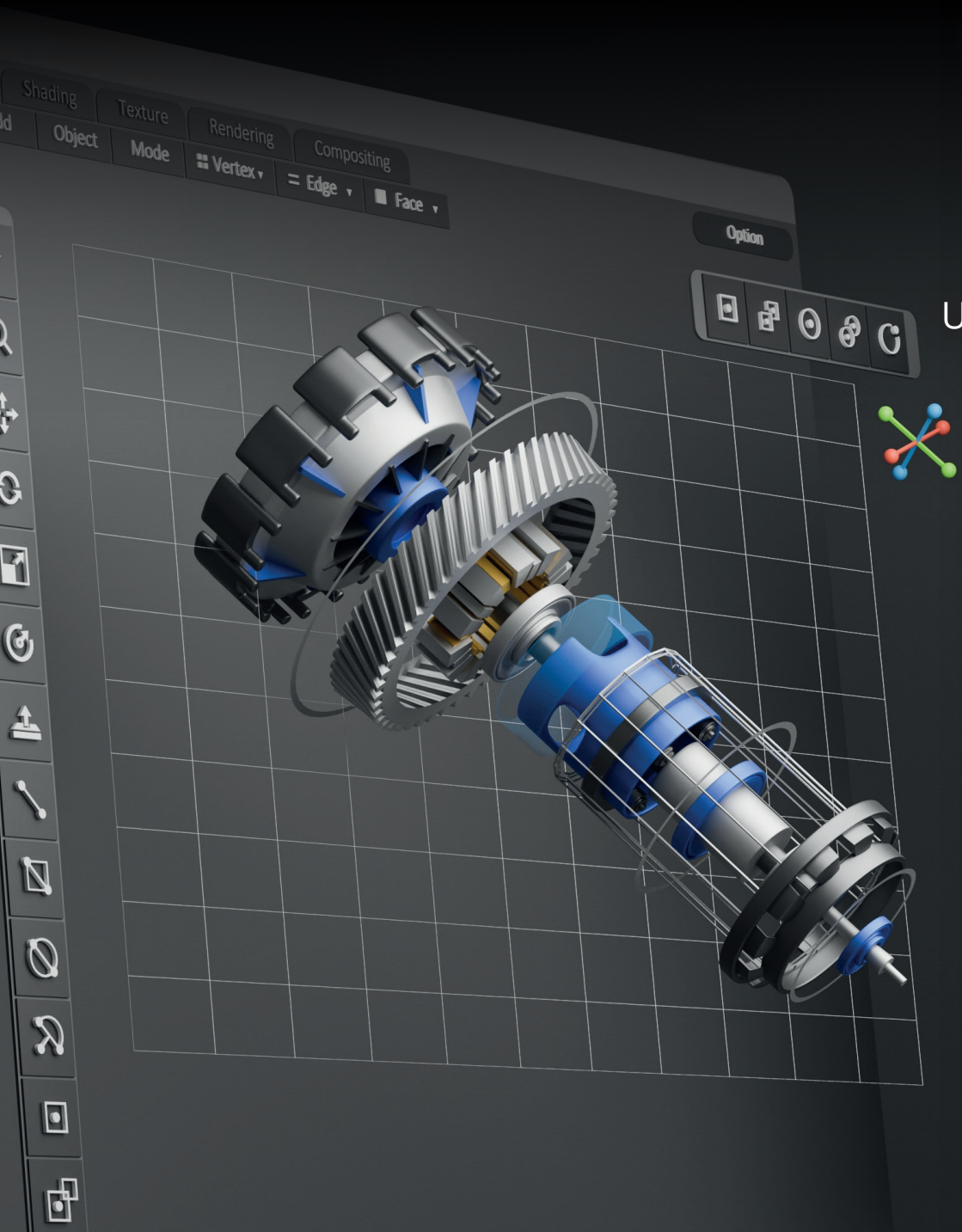
Higher Nationals

Engineering

Specification

For use with the Higher National Certificate and Higher National Diploma in Engineering

First teaching from September 2024
First Certification from 2025



Higher National Certificate Lvl 4

Higher National Diploma Lvl 5

Undergraduate Level Qualifications

Pearson BTEC

About Pearson

We are the world's leading learning company operating in countries all around the world. We provide content, assessment and digital services to learners, educational institutions, employers, governments and other partners globally. We are committed to helping equip learners with the skills they need to enhance their employability prospects and to succeed in the changing world of work. We believe that wherever learning flourishes so do people.

References to third party materials made in this specification are made in good faith. Pearson does not endorse, approve or accept responsibility for the content of materials, which may be subject to change, or any opinions expressed therein. (Materials may include textbooks, journals, magazines and other publications and websites.)

All information in this specification is correct at time of publication.

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1.0 Introduction

BTEC is one of the world's most recognised applied learning brands, engaging students in practical, interpersonal and thinking skills for more than three decades.

BTECs are work-related qualifications for students taking their first steps into employment, or for those already in employment and seeking career development opportunities. BTECs provide progression into the workplace, either directly or via study at university, and are also designed to meet employers' needs. Therefore, Pearson BTEC Higher Nationals are widely recognised by industry and higher education as the principal career-related qualifications at Levels 4 and 5.

When developing our BTEC Higher National qualifications, we work with a wide range of students, employers, higher education providers, colleges and subject experts to make sure the qualifications meet their needs and expectations. We also work closely with professional organisations to make sure the qualifications are in line with recognised professional standards.

The Pearson BTEC Higher National qualifications are designed to reflect the increasing need for high-quality professional and technical education at undergraduate Levels 4 and 5. They provide students with a clear line of sight to employment and to a degree at Level 6 if they choose.

1.1 Qualifications indicated ‘for England’

Qualifications that are indicated as ‘for England’ are designed to meet the requirements of specific occupational standards that meet the Institute for Apprenticeships and Technical Education (IfATE) current occupation criteria. Meeting the requirements of the occupational standards relates to:

- qualifications that are ‘quality marked’ as Higher Technical Qualifications (HTQs)
- the knowledge, skills and behaviours for identified occupations associated with the relevant occupational standards.

This qualification is NOT indicated as ‘For England’ and, therefore, is NOT ‘quality marked’ as a Higher Technical Qualification by the Institute for Apprenticeships and Technical Education (IfATE).

1.2 Qualifications not indicated ‘for England’

Qualifications that are **not** indicated as ‘for England’ can be delivered at any centre, in the UK or overseas, subject to approvals from Pearson. These qualifications are not ‘quality marked’ as HTQs by IfATE.

1.3 The student voice

Students are at the heart of what we do. That is why we consult them from the start when developing our Higher National qualifications. We involve them in writing groups, seek their feedback and take note of their opinions.

This helps us develop the best possible qualifications and learning experience for students worldwide.

1.4 Why choose Pearson BTEC Higher Nationals?

Pearson BTEC Higher National qualifications take a student-centred approach to the curriculum. There is a flexible, unit-based structure that focuses on developing the practical, interpersonal and thinking skills the student will need to succeed in employment and higher education. They represent the latest in professional standards and provide opportunities for students to develop skills and behaviours for work, for example by taking part in a group project or meeting a client brief. A student may achieve exemption from professional or vendor qualifications, or from membership of selected professional organisations, to help students on their journey to professional recognition or membership.

Pearson BTEC Higher Nationals are intended to keep doors open for future study if a student wishes to take their education further after completing a Higher National programme. They do this by allowing space for students to develop their higher education study skills, such as the ability to research. The study programme is clearly set out in line with the Quality Assurance Agency for Higher Education (QAA) Framework for Higher Education Qualifications (FHEQ) standards at Levels 4 and 5. This means that students who want to progress to Levels 5 or 6 study should feel better prepared.

The Pearson BTEC Higher Nationals meet these requirements by providing:

- a range of general and specialist study units, both mandatory and optional, each with a clear purpose, so there is something to suit each student's choice of programme and future progression plans
- up-to-date content, closely in line with the needs of employers, professional bodies and higher education, for a skilled future workforce
- Learning Outcomes mapped against professional body standards, where appropriate
- support for tutors, including Authorised Assignment Briefs, curriculum planning support and assessment guidance
- support for students, including digital learning resources and communities, through HN Global.

1.5 HN Global

Our HN Global website provides a specially designed range of digital resources to give tutors and students the best possible experience during their BTEC Higher Nationals course. More information is available at: https://hnglobal.highernationals.com.

1.6 Qualification titles

1.6.1 Pearson BTEC Level 4 Higher National Certificate in Engineering

Specialist pathways are in brackets in the qualification title:

- Pearson BTEC Level 4 Higher National Certificate in Engineering (Electrical and Electronic)
- Pearson BTEC Level 4 Higher National Certificate in Engineering (General)
- Pearson BTEC Level 4 Higher National Certificate in Engineering (Manufacturing)
- Pearson BTEC Level 4 Higher National Certificate in Engineering (Mechanical)
- Pearson BTEC Level 4 Higher National Certificate in Engineering (Mechatronics)
- Pearson BTEC Level 4 Higher National Certificate in Engineering (Operations)
- Pearson BTEC Level 4 Higher National Certificate in Engineering (Semiconductor Technologies).

1.6.2 Pearson BTEC Level 5 Higher National Diploma in Engineering

Specialist pathways are in brackets in the qualification title:

- Pearson BTEC Level 5 Higher National Diploma in Engineering (Electrical and Electronic)
- Pearson BTEC Level 5 Higher National Diploma in Engineering (General)
- Pearson BTEC Level 5 Higher National Diploma in Engineering (Manufacturing)
- Pearson BTEC Level 5 Higher National Diploma in Engineering (Mechanical)
- Pearson BTEC Level 5 Higher National Diploma in Engineering (Mechatronics)
- Pearson BTEC Level 5 Higher National Diploma in Engineering (Operations)
- Pearson BTEC Pearson BTEC Level 5 Higher National Diploma in Engineering (Semiconductor Technologies)
- Pearson BTEC Level 5 Higher National Diploma in Engineering (Embedded Electronic Systems).

1.7 Qualification codes

Ofqual Regulated Qualifications Framework (RQF) qualification numbers:

- Pearson BTEC Level 4 Higher National Certificate in Engineering: **610/3635/3**
- Pearson BTEC Level 5 Higher National Diploma in Engineering: **610/3636/5**

1.8 Awarding organisation

Pearson Education Ltd.

1.9 Key features

Pearson BTEC Higher National qualifications in Engineering offer the following:

- an exciting and informative study programme that stimulates and challenges students
- a simple and flexible structure that enables students to take the Higher National Certificate and then build on it in the Higher National Diploma, with optional units linked to their specialist area of study
- an opportunity for students to follow specialist routes of interest at Level 5, gaining the knowledge and skills they need to progress to higher education or employment in their specialist area
- core competencies throughout the curriculum, to support lifelong learning skills for personal and professional development
- the opportunity for centres to offer assessments that consider cognitive skills (what students know) along with effective and applied skills (how they behave and what they can do) to support a practical and dynamic approach to learning
- unit-specific assessment and Pearson-set themes designed to encourage thorough and analytical learning, challenge students and develop skills in critical thinking, personal responsibility and decision-making
- a flexible approach to assessment that supports progression to higher education or work and allows for different learning styles
- quality assurance measures that assure professional organisations, universities, businesses, colleges and students of the integrity and value of the qualifications, and
- a programme of learning designed to meet skills gaps in the current workforce and build today's talent to meet tomorrow's needs in an international environment.

1.10 Qualification frameworks

Pearson BTEC Higher National qualifications are recognised higher education qualifications in the UK. They are in line with the Framework for Higher Education Qualifications (FHEQ) in England, Wales and Northern Ireland, and Quality Assurance Agency (QAA) Subject Benchmark Statements, where applicable. These qualifications are part of the Regulated Qualifications Framework (RQF).

1.11 Collaborative development

We are very grateful to the university and further education tutors, employers, professional body representatives and other individuals who have generously shared their time and expertise to help us develop these new qualifications:

- 3D 360
- Alstom
- Avantel Limited
- BAE Systems Air
- BMW
- Didactic Services: Festo Partner
- Eaton
- Emirates
- F&H Power Consultants Ltd
- Gen2
- Grammer AG
- HBL Power Systems
- High Speed Two (HS2) Limited
- HQ Royal Air Force Air Cadets
- IQE plc
- Jaguar Land Rover
- J C Bamford Excavators Limited (JCB)
- Microchip Technology Inc
- Newport Wafer Fab Ltd
- Nexperia
- SharkNinja
- Siemens
- SPTS Technologies Ltd

- Trojan Energy
- Vertical Aerospace
- Engineering Council
- Institution of Engineering and Technology
- Institution of Mechanical Engineers (IMechE)
- Institute of the Motor Industry
- Royal Aeronautical Society
- Royal Academy of Engineering
- Semta (Science, Engineering and Manufacturing Technologies Alliance)
- Society of Operations Engineers
- Welding Institute
- Aston University
- Birmingham Metropolitan College
- Blackpool and The Fylde College
- Bridgwater & Taunton College
- Brunel University London
- City, University of London
- Cardiff and Vale College
- Coventry University
- DN Colleges Group
- Glasgow Caledonian University
- GTA England
- i-CATS University College
- Imperial College London
- Lancaster University
- Macclesfield College
- Newcastle University
- NFEC (National Forum of Engineering Centres)
- Oxford Brookes University
- Peterborough College
- Queen Mary University of London
- South Yorkshire Institute of Technology

- St Helens College
- Teesside University
- Truro and Penwith College
- University College London
- Warrington & Vale Royal College
- Warwickshire College
- University Centre Somerset
- University of Derby
- University of Glasgow
- University of Liverpool
- University of Sheffield
- University of South Wales
- University of Surrey
- University of Sussex
- University of the West of England
- West London Institute of Technology
- Yeovil College

2.0 Programming purpose and objectives

2.1 Purpose

The purpose of these qualifications is to develop students as independent-thinking professionals who can meet the demands of employers and adapt to a constantly changing world. The qualifications aim to widen access to higher education and improve the career prospects of those who take them.

2.2 Objectives

The objectives of these qualifications are:

- to develop the skills, knowledge and understanding students need to achieve high performance in the engineering and manufacturing environment
- to develop students with enquiring minds, who have the abilities and confidence to work across different engineering and manufacturing functions and to lead, manage, respond to change and tackle a range of complex engineering situations
- to provide the core skills required for a range of careers in the wider engineering sector, including electrical and electronics, manufacturing, mechanical, mechatronics, operations and semiconductors
- to offer a balance between employability skills and the knowledge essential for students with entrepreneurial, employment or academic ambitions
- to develop students' understanding of the major impact that new digital technologies have on the engineering and manufacturing environment
- to provide insight into engineering and manufacturing operations and the opportunities and challenges presented by a global marketplace
- to equip students with knowledge and understanding of culturally diverse organisations, cross-cultural issues, diversity and values, and to allow flexible study to meet local and specialist needs.

2.2.1 Health and safety in the Pearson BTEC Higher Nationals in Engineering

Health and safety in engineering and manufacturing is both a regulatory responsibility and a matter of ethical practice. It is important that everyone working in the industry, including those in education and training, is aware of the legislation, regulation and practice to ensure the safety of both those working in engineering and manufacturing and those who will use the equipment, facilities and infrastructure that are the outcomes of advancements in engineering and manufacturing.

Pearson has taken the approach that health and safety should be integrated throughout these Higher Nationals qualifications where appropriate. This is to ensure that students do not see health and safety matters as being separate or 'stand-alone' activities. Rather, health and safety should be understood as a standard feature of typical engineering and manufacturing practices. Many of the units within these qualifications include curriculum related to health and safety, sector regulations and statutory requirements. Where such topics are included in essential content it is a requirement that they are taught in sufficient breadth and depth to ensure that students understand the importance of the topic. Where there are assessment criteria that call specifically for students to evidence aspects of health and safety, risk assessment, legislation or regulation, it is required that this be designed as part of the assessment.

2.3 Aims of the Pearson BTEC Level 4 Higher National Certificate in Engineering

The Pearson BTEC Level 4 Higher National Certificate offers seven pathways for students who wish to concentrate on a particular aspect of engineering. These are:

- Electrical and Electronic
- General
- Manufacturing
- Mechanical
- Mechatronics
- Operations
- Semiconductor Technologies.

The Level 4 units lay the foundations of learning by providing a broad introduction to engineering and manufacturing. This develops and strengthens core skills while preparing students for specialist subjects at Level 5 or to enter employment with the qualities necessary for job roles that require some personal responsibility.

Students will gain a wide range of engineering and manufacturing knowledge linked to practical skills gained through research, independent study, directed study and workplace scenarios. Students are involved in activities that help them to develop vocational behaviours (the attitudes and approaches required for competence) and transferable skills. Transferable skills are those such as communication, teamwork, research and analysis, which are highly valued in higher education and the workplace.

By the end of Level 4, students will have sound knowledge of the basic concepts of engineering and manufacturing. They will be competent in a range of subject-specific skills as well as in general skills and qualities relevant to key areas of engineering.

(See *Section 6.2* for a full list of the mandatory core, specialist and optional units for each pathway.)

2.4 Aims of the Pearson BTEC Level 5 Higher National Diploma in Engineering

The Pearson BTEC Level 5 Higher National Diploma offers eight pathways for students who wish to concentrate on a particular aspect of engineering. These are:

- Electrical and Electronic
- General
- Manufacturing
- Mechanical
- Mechatronics
- Operations
- Semiconductor Technologies
- Embedded Electronic Systems.

The Level 5 units give students the opportunity to specialise in an engineering-related occupational area and to progress to degree-level study. The units prepare students to move on to specific areas of engineering and manufacturing at Level 6 or to enter employment with the qualities and abilities necessary for roles that require personal responsibility and decision-making.

Students will be able to develop and apply their own ideas to their studies, to deal with uncertainty and complexity, to explore solutions, demonstrate critical evaluation and use both theory and practice in a wide range of engineering and manufacturing situations.

By the end of Level 5, students will have a sound understanding of the principles in their area of specialist study and will know how to apply those principles more widely in engineering and manufacturing. They will be able to perform effectively in their specialist area.

(See *Section 6.2* for a full list of the mandatory core, specialist and optional units for each pathway.)

2.5 Developing students' employability skills and academic study skills

Employability skills (sometimes referred to as transferable skills) are vital to increase students' career prospects and contribute to their personal development. Our BTEC Higher Nationals in Engineering support students in developing the key skills, qualities and strengths that employers are looking for.

We divide employability skills into five main categories.

Problem-solving skills

These include:

- critical thinking
- using expert and creative solutions to solve non-routine problems
- using systems and digital technology, and
- generating and communicating ideas creatively.

Independent skills

These include:

- self-management
- adaptability and resilience
- self-monitoring and self-development
- self-analysis, and
- reflection, planning and prioritising.

Interpersonal skills

These include:

- leadership skills
- communicating effectively
- working with others
- negotiating and influencing, and
- presentation skills.

Commercial skills

These include:

- awareness of the commercial aspects of the engineering and manufacturing sector
- understanding local and global client requirements
- marketing, sales and promotion of engineering and manufacturing products and inventions, and
- managing and monitoring budgets.

Business skills

These include:

- awareness of types of engineering and manufacturing companies and governance structures
- ethical, social, legal and statutory responsibilities, and
- effective use of data and sector-related business management skills.

Students also benefit from opportunities for deeper learning, where they can make connections between different study units and select areas of interest for detailed study. In this way, BTEC Higher Nationals in Engineering provide a vocational context in which students can develop the knowledge and academic study skills they need to progress to university degree courses.

These academic study skills include:

- active research
- effective writing
- analytical skills
- critical thinking
- creative problem-solving
- decision-making
- preparing for exams, and
- using digital technology.

Students can also develop their academic skills through independent study modules and resources on the HN Global website at: https://hnglobal.highernationals.com/.

2.5.1 Use of mathematics and English within the curriculum

A career in engineering and manufacturing requires both technical skills and broader employability skills. For example, appropriate communication with clients and colleagues is an essential skill, so the ability to use mathematics and English in a professional context is a key area for student development.

This type of development is embedded throughout BTEC Higher Nationals, in line with industry requirements. During their course, students may, for example, be involved in:

- preparing written reports
- giving formal presentations
- taking part in informal conversations
- using professional, sector-specific language.

Some aspects of engineering and manufacturing require mathematics skills and we strongly recommend that all students complete diagnostic mathematics assessments before beginning a Higher National course, as well as having a grade 9 to 4 or A* to C in GCSE Mathematics. (See *Section 5.2* for more information.)

2.6 What could these qualifications lead to?

The Level 4 Higher National Certificate provides a solid grounding in engineering and manufacturing, which students can build on if they decide to continue their studies. The Level 5 Higher National Diploma allows students to specialise by committing to specific career paths and progression routes to degree-level study.

Once students have achieved the Level 5 Higher National Diploma, they can develop their careers in the engineering sector by:

- entering employment
- continuing existing employment
- linking with the appropriate professional body
- linking with the appropriate vendor-accredited certificates (if appropriate)
- committing to Continuing Professional Development (CPD)
- progressing to university.

2.6.1 Progression to university

The Level 5 Higher National Diploma is recognised by higher education providers as meeting admission requirements to many relevant undergraduate and integrated masters engineering-related courses, for example:

- BEng (Hons) Engineering
- BEng (Hons) Electrical and Electronic Engineering
- BEng (Hons) Manufacturing Engineering
- BEng (Hons) Production and Manufacturing Engineering
- BEng (Hons) Mechanical Engineering
- BEng (Hons) Operations Engineering
- BEng (Hons) Semiconductor Technologies
- BEng (Hons) Embedded Systems
- BEng (Hons) Mechatronics Engineering
- BSc (Hons) Engineering
- BSc (Hons) Electrical and Electronic Engineering
- BSc (Hons) Manufacturing Engineering
- BSc (Hons) Production and Manufacturing Engineering
- BSc (Hons) Mechanical Engineering
- BSc (Hons) Operations Engineering
- BSc (Hons) Semiconductor Technologies

- BSc (Hons) Embedded Systems
- BSc (Hons) Mechatronics
- MEng (Hons) Engineering
- MEng (Hons) Engineering (with professional placement)
- MEng (Hons) Electrical and Electronic Engineering
- MEng (Hons) Mechanical Engineering
- MEng (Hons) Manufacturing with Industrial Experience
- MEng (Hons) Production and Manufacturing Engineering
- MEng (Hons) Embedded Systems Engineering
- MEng (Hons) Electrical and Electronics Systems Engineering
- MTech Engineering
- MTech Engineering and Technology
- MSc Embedded Systems.

2.6.2 University recognition and articulations

We work with a range of higher education institutions around the world that accept Pearson BTEC Higher Nationals as a qualification for entry to their undergraduate degree courses. Many universities allow advanced entry to the second or third year of the course. Agreements can include transferring learning credits from one course or qualification to the other, articulation and case-by-case admission. An articulation agreement involves a university mapping the learning content of a Higher National against their degree programme(s). This process helps them understand how strong the alignment is between the Higher National and degree, and supports them in providing more guidance for learners during the admissions process.

Students should be aware that each university sets its own admission criteria and that those criteria can change. Before applying, students should understand the course entry requirements for the subject and year in which they want to study. For more information on entry requirements, including 2+1 articulations, please visit: https://hnglobal.highernationals.com/degree-finder.

3.0 Preparing students for employment

3.1 Designing with employers, for employers

As a large employer and qualification-awarding organisation, Pearson understands the value of developing the skills and talent of the future workforce. We believe in, and champion, higher technical education that is relevant to employers.

We work with employers, students, professional bodies, education providers and other experts to design qualifications with the future workforce in mind. Higher National qualifications blend employability skills with academic, business and technical knowledge. They support trainees and apprentices in their higher apprenticeship and other technical education programmes, as well as students working towards a degree. We update our programmes regularly to maintain their high quality and meet the changing needs of the workforce.

Employers contribute to our Higher Nationals in several ways.

- They are involved in every stage of designing our qualifications, from developing the structure and pathways to selecting subjects, developing content and approving qualifications.
- They help us deliver qualifications, for example through vendor accreditation, letters of support and co-badging. Our qualifications actively encourage training providers to work with employers. Work placements and work-through-learning are key features of BTEC Higher Nationals.
- They help us review and update our qualifications to meet occupational standards and provide supporting material such as case studies to reflect the real world of work.

We are committed to equipping apprentices, trainees and organisations with the tools and resources they need to support high-quality, innovative technical education and higher apprenticeship programmes that work.

Including a Higher National qualification as part of a higher apprenticeship or technical education programme gives students:

- an internationally recognised higher-level qualification in line with the FHEQ, and
- a stepping stone to continue their education or training and gain a recognised degree or professional qualification.

To find out more, and to access detailed mapping to higher apprenticeships and occupational standards for your qualification, please visit the following pages: https://qualifications.pearson.com/en/qualifications/apprenticeships.html and https://qualifications.pearson.com/en/qualifications/btec-higher-nationals/higher-nationals/higher-technical-qualifications.html on our website.

3.1.1 Employability skills and competencies for student career success

Pearson is committed to delivering learning that is rooted in the real world and to developing work-ready graduates with the professional skills and behaviours that employers need. The Pearson BTEC Higher National curriculum provides a clear line of sight to employment, depending on which specialist areas students complete. The aim is to produce students who are equipped to thrive in the changing world of work, whether they leave with an HNC or an HND qualification.

Table 1 shows the type of position in which a student graduating at each educational level might expect to start and gives some examples of the competencies expected.

Levels of competency			
Employability level at learning level	**Level 4 Operational**	**Level 5 Managerial**	**Level 6 Professional**
General employment outcomes for graduates at each level	Graduates can: • perform key engineering tasks • understand processes and operations, and • work effectively.	Graduates can: • increase performance through strategic planning to meet engineering sector aims, and • manage engineering functions to work effectively in lower- or middle-management positions.	Graduates can: • take the lead and direct others • manage change effectively in middle-management positions, and • apply creative problem-solving skills.

Levels of competency			
Employability level at learning level	**Level 4 Operational**	**Level 5 Managerial**	**Level 6 Professional**
Examples of roles in different areas of engineering and manufacturing	• Electrical engineering technician • Electronics engineering technician • Manufacturing systems technician • Control systems technician • Mechanical engineering technician • Automotive engineering technician • Engineering maintenance technician • Operations technicians • Integration and test technician • Assistant project manager • Process technician • Equipment technician • Fabrication technician • Device and test technician • Assembly technician	• Senior engineering technician • Senior manufacturing technician • Electrical systems project manager • Junior mechanical engineer • Junior maintenance engineer • Junior engineer (test equipment) • Technical support engineer • Junior embedded systems engineer • Junior process engineer • Equipment engineer • Electronic and assembly/test engineer • Junior fabrication engineer	• Process engineer • Senior equipment engineer • Electrical engineer • Electronics engineer • Manufacturing systems engineer • Senior automotive engineer • Senior maintenance engineer • Fabrication engineer • Senior project manager • Ground control systems manager • Engineering team lead

Table 1: Displaying levels of competency at employability level and examples of roles in different areas of engineering at each level

3.1.2 Developing competencies for the workplace

Core competencies developed on the specialist pathways of the programme will support students in preparing for a range of employment opportunities in their chosen sector. These core competencies collectively summarise the key capabilities that are important across the sector, covering areas of relevant expertise and technical skills that would be required within the sector to successfully perform a job, as defined in current advertised job vacancies.

Core competencies are developed on the programme within a balanced framework of cognitive (knowledge), affective (behaviours) and psychomotor (practical) Learning Outcomes to encourage a more vocational and practical approach to learning.

3.1.3 Professional body association and recognition

In developing the Pearson BTEC Higher Nationals in Engineering, we have liaised with the:

- Institution of Engineering and Technology (IET)
- Institution of Mechanical Engineers (IMechE)
- Royal Aeronautical Society (RAeS).

Letters of support and recognition can be found at: https://qualifications.pearson.com/en/qualifications/btec-higher-nationals/general-engineering-2017/industry-engagement.html. We aim to align to professional body competency standards, content and assessment to support students to develop as professional practitioners for the future. This adds value for students by offering them access to CPD.

3.1.3.1 Types of professional body agreements for Higher Nationals in Engineering

There are a variety of agreements that we have in place with professional organisations, although not all of these will apply to all qualifications.

- **Professional accreditation:** where a specific study programme prepares students to register for a professional qualification. In some cases, completing the Higher National Diploma in Engineering may be enough for students to receive the professional qualification.
- **Membership:** where students are offered student membership while studying, or progression to membership on completion of their qualification.
- **Recognition:** where a professional organisation recognises the value of a Higher National in preparing students for the industry.

- **Exemption:** where a professional organisation offers exemptions from units on some of its qualifications. This means that students completing these BTEC Higher National units will have covered the material required for those professional body units and can claim exemption when studying for the professional body qualification.

For full accreditation and exemption details for this qualification, where applicable, please refer to the Progression Hub on HN Global: https://hnglobal.highernationals.com/progression-hub/memberships-certs or on the 'Industry engagement' page in the engineering qualifications section of our website at https://qualifications.pearson.com/en/qualifications/btec-higher-nationals/general-engineering-2017/industry-engagement.html. We continue to add new agreements and update existing ones; please refer to these online pages for the most up-to-date information.

4.0 Centre support

You can access a wide range of resources and support to help you set up and deliver our Pearson BTEC Higher Nationals in Engineering with confidence.

4.1 Specification

This specification gives you details of the administration of the qualifications and information on the units included in them.

4.2 HN Global

HN Global is a dedicated online learning platform for all Pearson BTEC Higher National students and delivery centres. You can find various free resources to support staff in delivering a Pearson BTEC Higher National programme and to guide students on their learning journey. The HN Global forum connects students and tutors and provides the opportunity to discuss common themes and share good practice. HN Global also provides access to the following.

The learning zone includes student study materials such as core textbooks, study skills modules, the Progression Hub featuring opportunities to develop employability skills, an e-library and subject materials.

The tutor resources section hosts a wealth of delivery materials, reading lists, blended learning resources, video guidance on assessment and professional development opportunities. Staff can also access the QA Hub for templates and more centre support.

Short courses provide support for curriculum planning, developing schemes of work and developing students' academic skills.

These are available from the HN Global website at: https://hnglobal.highernationals.com.

4.3 Authorised Assignment Briefs

We provide a booklet of Authorised Assignment Briefs (AABs) for a sample of units. These AABs have been developed to support centres with their assessment strategy for the delivery of a sample of units, as well as providing guidance and inspiration for effective planning and design of future Assignment Briefs.

It is important to note:

1. AABs can be used by centres if they meet your specific requirements following internal verification. They have been written to assess students' knowledge, understanding and skills specifically relevant to the unit Learning Outcomes but they have not been contextualised to meet local need and international diversity. If using an AAB, the Assignment Brief should still be internally marked and made available for standards verification.
2. AABs can be modified and customised to meet localisation.

The AABs offer a range of real and simulated assessment activities, for example group work to encourage cooperation and social skills or a solution-focused case study to develop cognitive skills. The assessment grids for each unit explain the specific requirements for assessing these skills.

All assignments must still be moderated in line with the internal verification process. These AABs along with further guidance can be found in the *Effective assignment design for the Higher Nationals in Engineering: Authorised Assignment Briefs* booklet available on HN Global at: https://hnglobal.highernationals.com/.

The tutor resources section on HN Global also offers a wide range of resources and guidance documents to help you plan and design assessments effectively.

4.4 Assignment checking service

This is a free service for BTEC centres to make sure that assignments enable students to produce suitable evidence across the required Learning Outcomes.

It is especially useful for programme teams relatively new to BTEC and those who want to check that their assignments are fully meeting a unit's requirements. Please see: https://qualifications.pearson.com/en/support/Services/assignment-checking-service.html.

4.5 Pearson English

Pearson provides a full range of support for English learning, including diagnostics, qualifications and learning resources. Please see: https://www.pearson.com/languages.

The Pearson Languages portal also offers a variety of digital resources. The portal encourages users to get involved, and improves teaching and results.

5.0 Planning your programme

5.1 Delivering the Higher Nationals

As a large employer and qualification-awarding organisation, Pearson understands the value of developing the skills and talent of the future workforce. We believe in, and champion, higher technical education that is relevant to employers.

You play a central role in helping your students choose the right Pearson BTEC Higher National qualification.

Assess your students very carefully to make sure they take the right qualification and the right pathways and optional units. This will allow them to progress to the next stage in their learning or employment journey. You should also check the qualification structures and unit combinations carefully when giving students advice.

Make sure your students have access to a full range of information and advice to help them choose the right qualification and units. When students are recruited, you need to give them accurate information on the title and focus of the qualification they are studying for. Centres must provide a programme specification for approvals but it is also essential that centres produce:

- a staff handbook to support both full-time and part-time members of your team, and
- a student handbook to guide students through the course requirements so they know what is expected of them and understand their rights.

You can find more information in the *BTEC Higher Nationals Centre Guide to Quality Assurance and Assessment* handbook, available to download on our website: https://qualifications.pearson.com/en/qualifications/btec-higher-nationals/about/quality-assurance-process.html.

5.1.1 Centre approval

We need to approve all centres before they can offer our qualifications. This is to make sure that centres are ready to assess students and that we can provide the support they need.

For more information about becoming a centre and gaining approval to run our qualifications, please see the 'Centre/Qualification approvals' page in the support section of our website at: https://support.pearson.com/uk/s/article/Centre-Qualification-Approvals.

5.1.2 Tutor knowledge

Pearson does not currently explicitly stipulate any qualification or experience requirements for staff involved in the delivery, assessment and internal verification of BTEC Higher National qualifications. This is because it would not be practical to impose such stipulations to cover the wide range of subject areas and fields of experience that the BTEC Higher National qualifications encompass.

However, it is expected that centres recruit all delivery, assessment and internal verification staff with integrity and have robust staff recruitment processes in place. It is expected that staff hold a nationally recognised qualification at or above the level of the qualification being delivered and/or equivalent relevant experience.

You can find more information in the *BTEC Higher Nationals Centre Guide to Quality Assurance and Assessment* handbook, available to download on our website: https://qualifications.pearson.com/en/qualifications/btec-higher-nationals/about/quality-assurance-process.html.

5.1.3 Resources

As part of your centre approval, you will need to show that the right resources and workspaces are available to deliver Pearson BTEC Higher Nationals. Some units need specific resources. This is clearly explained in the unit descriptions, where appropriate.

5.1.4 Delivering learning

With our approval, you can deliver our Pearson BTEC Higher Nationals using a mixture of learning options that meet your students' needs. We recommend you offer full-time, part-time, blended learning and distance learning modes of delivery.

If you are delivering distance learning, please see the *Pearson distance learning and assessment policy* available to download on our website at: https://qualifications.pearson.com/en/support/support-topics/understanding-our-qualifications/policies-for-centres-learners-and-employees.html.

5.1.5 Support from Pearson

For each programme with active registrations, we will provide an external examiner to help you plan and review assessments. You will also be able to access training events and support from a dedicated team of Pearson Higher National subject leads. Please see: https://qualifications.pearson.com/en/qualifications/btec-higher-nationals.html.

5.2 Entry requirements and admissions

Pearson does not set formal entry requirements for our qualifications, but as a centre you are responsible for making sure that the students you recruit have a reasonable chance of success on the programme.

Students who have recently been in education are likely to need:

- a BTEC Level 3 qualification in engineering or equivalent qualifications in engineering
- a GCE Advanced Level profile that demonstrates strong performance in a relevant subject or adequate performance in more than one GCE subject. This profile is likely to be supported by GCSE grades at 9 to and/or 4A* to C (or equivalent) (or equivalent) in subjects such as mathematics, physics, engineering and English
- other related Level 3 qualifications
- an Access to Higher Education Diploma from an approved further education institution
- relevant work experience, or
- an international equivalent to the above qualifications.

Our recognition of prior learning policy means that students' previous learning and experience can be taken into account and they may be awarded certain qualifications or units of a qualification based on that learning or experience. Please see *Section 9* for more information.

5.2.1 English language requirements

Pearson's mission is to help people make more of their lives through learning.

To assist centres to recruit students who have the skills to benefit from undertaking a Higher National programme of study, we are providing the following clarification regarding the English language **admission requirements** when offering places to applicants.

All centres delivering Pearson BTEC Higher National qualifications in English must ensure that each applicant can demonstrate their capability to learn and be assessed at the relevant level in English.

Students applying for a Pearson BTEC Higher National qualification that is **taught and assessed completely in English** will need a certain level of English language skills.

Before accepting students onto a programme, you must make sure that those who are non-native English speakers and who have not carried out their final two years of schooling in English can demonstrate ability at a standard equivalent to:

- Common European Framework of Reference (CEFR) level **B2**
- Pearson Test of English (PTE) Academic **51**

- International English Language Testing System (IELTS) **5.5** (reading and writing must be at **5.5**).

Students who have completed a Pearson BTEC Higher National qualification delivered partly or completely in another language but assessed in English will also need to demonstrate ability in English to the standard outlined above, but at the **end** of the programme.

It is up to you to decide what proof of ability students will need to provide.

5.3 Access to study

This section focuses on the administration you will need to carry out when delivering our Pearson BTEC Higher National qualifications. It will be most relevant to quality controllers, programme leaders and examinations officers.

Our qualifications should:

- be available to everyone able to reach the required standards
- be free from any barriers that restrict access and progress, and
- provide equal opportunities for all those who want to access the qualifications.

For more information, please see our *Equity, diversity and inclusion in Pearson qualifications and related services policy*, available at: https://qualifications.pearson.com/en/support/support-topics/understanding-our-qualifications/policies-for-centres-learners-and-employees.html.

Please recruit with integrity when registering students to our Pearson BTEC Higher National programmes. You should:

- make sure that students applying have the information and advice they need about the qualification to be sure it meets their needs
- check each student's qualifications and experience to make sure they have the potential to achieve the qualification, and
- consider the support available to students with disabilities and specific needs during teaching and assessment. For more guidance, please see *Section 5.6.2* on reasonable adjustments to assessments.

5.4 Student registration and entry

All students should be registered on the qualification they are studying and suitable arrangements need to be made for internal and external verification. For information on making registrations, please see the information manual available in the support section of our website at: https://qualifications.pearson.com/en/support/support-for-you/exam-officers-administrators/entries-information-manual.html?view=manual.

Students can be formally assessed only for a qualification on which they are registered. If a student changes the qualification they want to study for (for example if they decide to choose a different specialist pathway), you must transfer their registration to the new pathway. We cannot sample a student's work unless they are registered on the correct pathway.

5.5 Access to assessments

Assessments need to be managed carefully so that all students are treated fairly and that results and certificates are published without delay.

Our equity, diversity and inclusion policy requires that:

- all students have an equal opportunity to access our qualifications and assessments, and
- our qualifications are awarded in a way that is fair to every student.

We are committed to making sure that:

- students with a protected characteristic as defined by law (for example race, sexual orientation, religion or belief) are not disadvantaged in comparison with students who do not share that characteristic
- all students achieve the recognition they deserve for taking a qualification, and this achievement can be compared fairly with the achievement of their peers.

For more information on access arrangements, please visit the Joint Council for Qualifications (JCQ) website at: https://www.jcq.org.uk/exams-office/access-arrangements-and-special-consideration/.

5.6 Administrative arrangements for internal assessment

5.6.1 Records

You are required to retain records of assessment for each student. Records should include assessments taken, decisions reached and any adjustments or appeals. Further information on quality and assessment can be found in our UK and international guides available in the support section of our website: https://qualifications.pearson.com/en/qualifications/btec-higher-nationals/about/quality-assurance-process.html. We may ask to audit your records, so they must be retained as specified. All student work must be retained for **a minimum of 12 weeks** after certification has taken place.

5.6.2 Reasonable adjustments to assessment

A reasonable adjustment is one that is made before a student takes an assessment, to ensure that they have fair access to demonstrate the requirements of the assessment.

You are able to make adjustments to internal assessments to take account of the needs of individual students. In most cases this can be achieved through a defined time extension or by adjusting the format of evidence. We can advise you if you are uncertain as to whether an adjustment is fair and reasonable. You need to plan for time to make adjustments, if necessary.

Further information on how to make adjustments for students with protected characteristics is available in the support section of our website: https://qualifications.pearson.com/en/support/support-topics/understanding-our-qualifications/policies-for-centres-learners-and-employees.html.

5.6.3 Special consideration

Special consideration is given after an assessment has taken place for students who have been affected by adverse circumstances, such as illness, and require an adjustment of grade to reflect normal level of attainment. You must operate special consideration in line with Pearson policy. You can provide special consideration related to the period of time given for evidence to be provided, or for the format of the assessment (if it is equally valid). You may not substitute alternative forms of evidence to that required in a unit, or omit the application of any assessment criteria to judge attainment. Pearson can consider applications for special consideration in line with the JCQ guide to the special consideration process, available from the JCQ website: https://www.jcq.org.uk/exams-office/access-arrangements-and-special-consideration/regulations-and-guidance/.

Please note that your centre must have a policy for dealing with mitigating circumstances if students are affected by adverse circumstances, such as illness, which result in non-submission or late submission of assessment.

5.6.4 Appeals against assessment

Your centre must have a policy for dealing with appeals from students. These appeals may relate to assessment decisions being incorrect or assessment not being conducted fairly. The first step in such a policy could be a consideration of the evidence by a programme leader or other member of the programme team. The assessment plan should allow time for potential appeals after assessment decisions have been given to students. If there is an appeal by a student, you must document the appeal and its resolution. Students have a final right of appeal to Pearson, but only if the procedures that you have put in place have been followed.

Further details of our policy on enquiries and appeals are available in the support section of our website: https://qualifications.pearson.com/en/support/support-topics/understanding-our-qualifications/policies-for-centres-learners-and-employees.html/ and can be downloaded from the JCQ website https://www.jcq.org.uk/exams-office/access-arrangements-and-special-consideration/.

If your centre is located in England or Wales and the student is still dissatisfied with the final outcome of their appeal, they can make a further appeal to the Office of the Independent Adjudicator (OIA) by emailing: enquiries@oiahe.org.uk. In Northern Ireland a further appeal may be lodged with the Northern Ireland Public Service Ombudsman (NIPSO) by emailing: nipso@nipso.org.uk.

5.7 Dealing with malpractice in assessment

'Malpractice' refers to acts that undermine the integrity and validity of assessment, the certification of qualifications and/or may damage the authority of those responsible for delivering the assessment and certification.

Pearson does not tolerate actual or attempted actions of malpractice by learners, centre staff or centres in connection with Pearson qualifications. Pearson may impose penalties and/or sanctions on learners, centre staff or centres where malpractice or attempted malpractice has been proven.

Malpractice may occur or be suspected in relation to any unit or type of assessment within a qualification. For further details on malpractice and advice on preventing malpractice by learners, please see Pearson's *Centre guidance: Dealing with malpractice and maladministration*, available on our website: https://qualifications.pearson.com/en/support/support-topics/understanding-our-qualifications/policies-for-centres-learners-and-employees.html.

Centres are required to take steps to prevent malpractice and to investigate instances of suspected malpractice. Learners must be given information that explains what malpractice is for internal assessment and how suspected incidents will be dealt with by the centre. The *Centre guidance: Dealing with malpractice and maladministration* document gives full information on the actions we expect you to take.

Pearson may conduct investigations if we believe a centre is failing to conduct internal assessment according to our policies. The malpractice guidance document gives further information and examples, and details the penalties and sanctions that may be imposed.

In the interests of learners and centre staff, centres need to respond effectively and openly to all requests relating to an investigation into an incident of suspected malpractice.

5.7.1 Student malpractice

The Heads of Centres are required to report incidents of suspected student malpractice that occur during Pearson qualifications. We ask centres to complete a *JCQ Form M1*, available to download at: www.jcq.org.uk/malpractice, and email it with any accompanying documents (signed statements from the student and invigilator, copies of evidence etc.) to the Investigations Processing team at candidatemalpractice@pearson.com. The responsibility for determining appropriate sanctions or penalties to be imposed on students lies with Pearson.

Students must be informed at the earliest opportunity of the specific allegation and the centre's malpractice policy, including the right of appeal. Students found guilty of malpractice may be disqualified from the qualification for which they have been entered with Pearson.

Failure to report malpractice constitutes staff or centre malpractice.

5.7.2 Tutor and centre malpractice

Heads of Centres are required to inform Pearson's Investigations Processing team of any incident of suspected malpractice (which includes maladministration) by centre staff, before any investigation is undertaken. The Heads of Centres are requested to inform the investigations team by submitting a *JCQ Form M2* (downloadable from www.jcq.org.uk/malpractice) with supporting documentation to: pqsmalpractice@pearson.com. Where Pearson receives allegations of malpractice from other sources (for example Pearson staff, anonymous informants), the investigations team will conduct the investigation directly or may ask the Head of Centre to assist.

Pearson reserves the right in cases of suspected malpractice to withhold the issuing of results/certificates while an investigation is in progress. Depending on the outcome of the investigation, results and/or certificates may not be released or they may be withheld.

We reserve the right to withhold certification when undertaking investigations, audits and quality assurance processes. You will be notified within a reasonable period of time if this occurs.

5.7.3 Sanctions and appeals

Where malpractice is proven, we may impose sanctions or penalties, such as:

- mark reduction for affected external assessments
- disqualification from the qualification, or
- debarment from registration for Pearson qualifications for a period of time.

If we are concerned about your centre's quality procedures, we may impose sanctions such as:

- working with centres to create an improvement action plan
- requiring staff members to receive further training
- placing temporary suspensions on certification of learners
- placing temporary suspensions on registration of learners
- debarring staff members or the centre from delivering Pearson qualifications, or
- suspending or withdrawing centre approval status.

The centre will be notified if any of these apply.

Pearson has established procedures for considering appeals against penalties and sanctions arising from malpractice. Appeals against a decision made by Pearson will normally be accepted only from the Head of Centre (on behalf of learners and/or members of staff) and from individual members (in respect of a decision taken against them personally). Further information on appeals can be found in the JCQ appeals booklet available at: https://www.jcq.org.uk/exams-office/appeals.

6.0 Programme structure

6.1 Units, credits and total qualification time (TQT)

The Higher National Certificate (HNC) is a Level 4 qualification made up of 120 credits. It is usually studied full-time over one year or part-time over two years.

The Higher National Diploma (HND) is a Level 4 and Level 5 qualification made up of 240 credits. It is usually studied full-time over two years or part-time over four years.

Pearson would expect an HND student to have achieved at least 90 credits at Level 4 before progressing to Level 5 units. This allows the student to submit the remaining 30 credits at Level 4 while continuing with their Level 5 study.

If an HND student does not complete the full qualification, they may be awarded an HNC if they have gained enough credits.

Pearson BTEC Higher Nationals consist of core units, specialist units and optional units.

- Core and specialist units are mandatory.
- Specialist units provide a specific occupational focus to the qualification, in line with professional body standards.
- Optional units provide greater depth and breadth of study and can be localised.

Each unit usually carries 15 credits. Units are designed around the amount of time it will take for a student to complete them and receive a qualification. This is known as the total qualification time (TQT). TQT includes guided learning activities, directed learning activities and assessment. Each 15-credit unit has a TQT of 150 hours – 60 guided learning hours (GLH) and 90 independent learning hours (ILH). (For more information about guided and independent learning see *Sections 6.1.1* and *6.1.2*.)

- **The total qualification time for Higher National Certificate (HNC) = 1,200 hours.**
- **The total qualification time for Higher National Diploma (HND) = 2,400 hours.**

Examples of activities that can contribute to TQT include:

- guided learning
- independent and unsupervised research and learning
- unsupervised creation of a portfolio of work experience
- unsupervised e-learning
- unsupervised e-assessments
- unsupervised coursework
- watching a recorded podcast or webinar, and
- unsupervised work-based learning.

6.1.1 Guided learning hours

These are the hours where a tutor is present to give specific guidance towards the learning aim being studied. Guided learning hours include lectures, tutorials and supervised study in, for example, open learning centres and learning workshops. They also include supervised assessment activities such as invigilated exams, observed assessments and observed work-based practice.

- **The total guided learning hours for Higher National Certificate (HNC) = 480 hours.**
- **The total guided learning hours for Higher National Diploma (HND) = 960 hours.**

Examples of activities that can contribute to guided learning include:

- classroom-based learning supervised by a tutor
- work-based learning supervised by a tutor
- a live webinar or telephone tutorial with a tutor
- live e-learning supervised by a tutor, and
- all forms of assessment guided or supervised at the time by a tutor or other education or training provider. This includes where the assessment is competence-based and turned into a learning opportunity.

6.1.2 Independent learning hours

These are the hours where a student is learning without the direct guidance of a member of centre staff. They are critical to the student's ability to develop knowledge and skills, as well as providing them with the opportunity to develop key transferable skills such as self-discipline, time management and self-motivation.

- **The total independent learning hours for Higher National Certificate (HNC) = 720 hours.**
- **The total independent learning hours for Higher National Diploma (HND) = 1,440 hours.**

Some examples of activities that can contribute to independent learning include:

- self-directed research and investigation
- reading set texts or other sources of information
- watching subject-related videos as part of investigation and research
- reviewing recordings of scheduled sessions or notes from those sessions
- peer activities, such as group meetings and online discussions, where students explore their learning together, and
- reviewing and recording thoughts on their own learning.

6.2 Programme structures

Programme structures specify the:

- total credit value of the qualification
- minimum credit to be achieved at the level of the qualification
- core units required
- specialist units required
- optional units available, and
- maximum credit value in units that can be centre-commissioned.

When combining units for our Pearson BTEC Higher National qualification, it is up to the centre to make sure that the correct combinations are followed.

6.2.1 Pearson BTEC Level 4 Higher National Certificate in Engineering

- Requires at least 120 credits, all at Level 4
- Total qualification time = 1,200 hours
- Total guided learning hours = 480 hours
- Mix of core, specialist and optional units, totalling 120 credits.

6.2.2 Pearson BTEC Level 4 Higher National Certificate in Engineering (pathways and unit combinations)

6.2.2.1 Pearson BTEC Higher National Certificate in Engineering (General)

Pearson BTEC Higher National Certificate in Engineering (General)			
Unit type	**Unit**	**Credits**	**Level**
Core *Mandatory*	4002: Engineering Mathematics	15	4
Core *Mandatory*	4003: Engineering Science I	15	4
Core *Mandatory*	One unit from Core Unit Group 1 OR Core Unit Group 2 *(See Table 9 for Level 4 Core Unit Groups and the note on unit selection from the same group)*	15	4
Core *Mandatory*	One unit from Core Unit Group 1 OR Core Unit Group 2 *(See Table 9 for Level 4 Core Unit Groups and the note on unit selection from the same group)*	15	4
Plus **60 credits** from **any four** units from Level 4 Optional Bank: Group 4. The combination of units selected **must not** replicate any other pathway or qualification. Certification claims will be ineligible if a barred combination of units is selected. **Note 1:** Centres are advised to offer *Unit 4061: Programming for Engineers* as an optional unit to meet growing sector needs and to assist with progression requirements.			

Table 2: Pathway structure for Higher National Certificate in Engineering (General) at Level 4

6.2.2.2 Pearson BTEC Higher National Certificate in Engineering (Electrical and Electronic)

Pearson BTEC Higher National Certificate in Engineering (Electrical and Electronic)			
Unit type	**Unit**	**Credits**	**Level**
Core *Mandatory*	4002: Engineering Mathematics	15	4
Core *Mandatory*	4003: Engineering Science I	15	4
Core *Mandatory*	One unit from Core Unit Group 1 OR Core Unit Group 2 *(See Table 9 for Level 4 Core Unit Groups and the note on unit selection from the same group)*	15	4
Core *Mandatory*	One unit from Core Unit Group 1 OR Core Unit Group 2 *(See Table 9 for Level 4 Core Unit Groups and the note on unit selection from the same group)*	15	4
Specialist *Mandatory*	4019: Electrical and Electronic Principles*	15	4
Plus **45 credits** from **any three** units from the Level 4 Optional Bank: Group 4. The combination of units selected **must not** replicate any other pathway or qualification. Certification claims will be ineligible if a barred combination of units is selected. **Note 2:** Centres are advised to offer *Unit 4061: Programming for Engineers* as an optional unit to meet growing sector needs and to assist with progression requirements. **Note 3:** *Specialist units are available as mandatory or optional units for some other qualifications/pathways.			

Table 3: Pathway structure for Higher National Certificate in Engineering (Electrical and Electronic) at Level 4

6.2.2.3 Pearson BTEC Higher National Certificate in Engineering (Manufacturing)

Pearson BTEC Higher National Certificate in Engineering (Manufacturing)			
Unit type	**Unit**	**Credits**	**Level**
Core *Mandatory*	4002: Engineering Mathematics	15	4
Core *Mandatory*	4003: Engineering Science I	15	4
Core *Mandatory*	One unit from Core Unit Group 1 OR Core Unit Group 2 *(See Table 9 for Level 4 Core Unit Groups and the note on unit selection from the same group)*	15	4
Core *Mandatory*	One unit from Core Unit Group 1 OR Core Unit Group 2 *(See Table 9 for Level 4 Core Unit Groups and the note on unit selection from the same group)*	15	4
Specialist *Mandatory*	4014: Production Engineering for Manufacture	15	4
Specialist *Mandatory*	4017: Quality and Process Improvement*	15	4
Plus **30 credits** from **any two** units from Level 4 Optional Bank: Group 4. The combination of units selected **must not** replicate any other pathway or qualification. Certification claims will be ineligible if a barred combination of units is selected. **Note 4:** Centres are advised to offer *Unit 4061: Programming for Engineers* as an optional unit to meet growing sector needs and to assist with progression requirements. **Note 5:** *Specialist units are available as mandatory or optional units for some other qualifications/pathways.			

Table 4: Pathway structure for Higher National Certificate in Engineering (Manufacturing) at Level 4

6.2.2.4 Pearson BTEC Higher National Certificate in Engineering (Mechanical)

Pearson BTEC Higher National Certificate in Engineering (Mechanical)			
Unit type	**Unit**	**Credits**	**Level**
Core *Mandatory*	4002: Engineering Mathematics	15	4
Core *Mandatory*	4003: Engineering Science I	15	4
Core *Mandatory*	One unit from Core Unit Group 1 OR Core Unit Group 2 *(See Table 9 for Level 4 Core Unit Groups and the note on unit selection from the same group)*	15	4
Core *Mandatory*	One unit from Core Unit Group 1 OR Core Unit Group 2 *(See Table 9 for Level 4 Core Unit Groups and the note on unit selection from the same group)*	15	4
Specialist *Mandatory*	4008: Mechanical Principles	15	4
Specialist *Mandatory*	4013: Fundamentals of Thermodynamics and Heat Transfer*	15	4
Plus **30 credits** from **any two** units from Level 4 Optional Bank: Group 4. The combination of units selected **must not** replicate any other pathway or qualification. Certification claims will be ineligible if a barred combination of units is selected. **Note 6:** If the student has no prior practical experience, then it is highly recommended that *Unit 4010: Mechanical Workshop Practices* is the selected optional unit. **Note 7:** Centres are advised to offer *Unit 4061: Programming for Engineers* as an optional unit to meet growing sector needs and to assist with progression requirements. **Note 8:** *Specialist units are available as mandatory or optional units for some other qualifications/pathways.			

Table 5: Pathway structure for Higher National Certificate in Engineering (Mechanical) at Level 4

6.2.2.5 Pearson BTEC Higher National Certificate in Engineering (Mechatronics)

Pearson BTEC Higher National Certificate in Engineering (Mechatronics)			
Unit type	**Unit**	**Credits**	**Level**
Core *Mandatory*	4002: Engineering Mathematics	15	4
Core *Mandatory*	4003: Engineering Science I	15	4
Core *Mandatory*	One unit from Core Unit Group 1 OR Core Unit Group 2 *(See Table 9 for Level 4 Core Unit Groups and the note on unit selection from the same group)*	15	4
Core *Mandatory*	One unit from Core Unit Group 1 OR Core Unit Group 2 *(See Table 9 for Level 4 Core Unit Groups and the note on unit selection from the same group)*	15	4
Specialist *Mandatory*	4006: Mechatronics*	15	4
Plus **45 credits** from **any three** units from Level 4 Optional Bank: Group 4. The combination of units selected **must not** replicate any other pathway or qualification. Certification claims will be ineligible if a barred combination of units is selected. **Note 9:** Centres are advised to offer *Unit 4061: Programming for Engineers* as an optional unit to meet growing sector needs and to assist with progression requirements. **Note 10:** *Specialist units are available as mandatory or optional units for some other qualifications/pathways.			

Table 6: Pathway structure for Higher National Certificate in Engineering (Mechatronics) at Level 4

6.2.2.6 Pearson BTEC Higher National Certificate in Engineering (Operations)

Pearson BTEC Higher National Certificate in Engineering (Operations)			
Unit type	**Unit**	**Credits**	**Level**
Core *Mandatory*	4002: Engineering Mathematics	15	4
Core *Mandatory*	4003: Engineering Science I	15	4
Core *Mandatory*	One unit from Core Unit Group 1 OR Core Unit Group 2 *(See Table 9 for Level 4 Core Unit Groups and the note on unit selection from the same group)*	15	4
Core *Mandatory*	One unit from Core Unit Group 1 OR Core Unit Group 2 *(See Table 9 for Level 4 Core Unit Groups and the note on unit selection from the same group)*	15	4
Plus **60 credits** from **any four** units from Level 4 Optional Bank: Group 3. The combination of units selected **must not** replicate any other pathway or qualification. Certification claims will be ineligible if a barred combination of units is selected. **Note 11**: Centres are advised to offer *Unit 4061: Programming for Engineers* as an optional unit to meet growing sector needs and to assist with progression requirements.			

Table 7: Pathway structure for Higher National Certificate in Engineering (Operations) at Level 4

6.2.2.7 Pearson BTEC Higher National Certificate in Engineering (Semiconductor Technologies)

Pearson BTEC Higher National Certificate in Engineering (Semiconductor Technologies)			
Unit type	**Unit**	**Credits**	**Level**
Core *Mandatory*	4002: Engineering Mathematics	15	4
Core *Mandatory*	4003: Engineering Science I	15	4
Core *Mandatory*	One unit from Core Unit Group 1 OR Core Unit Group 2 *(See Table 9 for Level 4 Core Unit Groups and the note on unit selection from the same group)*	15	4
Core *Mandatory*	One unit from Core Unit Group 1 OR Core Unit Group 2 *(See Table 9 for Level 4 Core Unit Groups and the note on unit selection from the same group)*	15	4
Specialist *Mandatory*	4039: Semiconductor Manufacture*	15	4
Specialist *Mandatory*	4040: Semiconductor Production Environments*	15	4
Plus **30 credits** from **any two** units from Level 4 Optional Bank: Group 4. The combination of units selected **must not** replicate any other pathway or qualification. Certification claims will be ineligible if a barred combination of units is selected. **Note 12:** Centres are advised to offer *Unit 4061: Programming for Engineers* as an optional unit to meet growing sector needs and to assist with progression requirements. **Note 13**: *Specialist units are available as mandatory or optional units for some other qualifications/pathways.			

Table 8: Pathway structure for Higher National Certificate in Engineering (Semiconductor Technologies) at Level 4

6.2.2.8 Pearson BTEC Higher National Certificate in Engineering Level 4 Optional Bank

Higher National Certificate in Engineering (Electrical and Electronic) **Higher National Certificate in Engineering (General)** **Higher National Certificate in Engineering (Manufacturing)** **Higher National Certificate in Engineering (Mechanical)** **Higher National Certificate in Engineering (Mechatronics)** **Higher National Certificate in Engineering (Operations)** **Higher National Certificate in Engineering (Semiconductor Technologies)**			
Unit type	**Unit**	**Credits**	**Level**
Core Unit Group 1 *Note: All units in Group 1 must be taken at Level 4 for progression purposes.*			
Core *Mandatory*	4001: Engineering Design	15	4
Core *Mandatory*	4004: Managing a Professional Engineering Project *This is a Pearson-set theme unit.*	15	4
Core Unit Group 2 *Note: All units in Group 2 must be taken at Level 4 for progression purposes.*			
Core *Mandatory*	4062: Professional Engineering Practice *This is a Pearson-set theme unit.*	15	4
Core *Mandatory*	4063: Engineering Mechanics and Materials	15	4
Note 14: Core Unit Group 1 continues to offer the same units from the 2018 Higher National Engineering qualification to ensure continuity and smooth progression or programme transfers for students. **Note 15:** Core Unit Group 2 offers a different combination of units in support of the new engineering qualifications introduced in 2022 to ensure flexibility, with more choice and programme transfers between the qualifications.			

Table 9: Level 4 Core Unit Groups

Higher National Certificate in Engineering (Operations)			
Optional unit	4018: Maintenance Engineering	15	4
Optional unit	4024: Electro, Pneumatic and Hydraulic Systems	15	4
Optional unit	4025: Operations and Plant Management	15	4
Optional unit	4026: Electrical Systems and Fault Finding	15	4
Optional unit	4027: CAD for Schematics in Maintenance Engineering	15	4
Optional unit	4061: Programming for Engineers*	15	4
Higher National Certificate in Engineering (Electrical and Electronic) **Higher National Certificate in Engineering (General)** **Higher National Certificate in Engineering (Manufacturing)** **Higher National Certificate in Engineering (Mechanical)** **Higher National Certificate in Engineering (Mechatronics)** **Higher National Certificate in Engineering (Semiconductor Technologies)**			
Optional unit	4005: Renewable Energy	15	4
Optional unit	4007: Machining and Processing of Engineering Materials	15	4
Optional unit	4008: Mechanical Principles*	15	4
Optional unit	4009: Materials, Properties and Testing	15	4
Optional unit	4010: Mechanical Workshop Practices	15	4
Optional unit	4011: Fluid Mechanics	15	4
Optional unit	4012: Engineering Management	15	4
Optional unit	4013: Fundamentals of Thermodynamics and Heat Transfer*	15	4
Optional unit	4014: Production Engineering for Manufacture*	15	4
Optional unit	4015: Automation, Robotics and Programmable Logic Controllers (PLCs)	15	4
Optional unit	4016: Instrumentation and Control Systems	15	4
Optional unit	4017: Quality and Process Improvement*	15	4
Optional unit	4018: Maintenance Engineering	15	4
Optional unit	4019: Electrical and Electronic Principles*	15	4

Optional unit	4020: Digital Principles	15	4
Optional unit	4021: Electrical Machines	15	4
Optional unit	4022: Electronic Circuits and Devices*	15	4
Optional unit	4023: Computer-Aided Design and Manufacture (CAD/CAM)	15	4
Optional unit	4024: Electro, Pneumatic and Hydraulic Systems	15	4
Optional unit	4025: Operations and Plant Management	15	4
Optional unit	4026: Electrical Systems and Fault Finding	15	4
Optional unit	4027: CAD Schematics for Maintenance Engineering	15	4
Optional unit	4028: Materials Engineering with Polymers	15	4
Optional unit	4029: Polymer Manufacturing Processes	15	4
Optional unit	4030: Industry 4.0	15	4
Optional unit	4031: Introduction to Professional Engineering Management	15	4
Optional unit	4033: Programmable Logic Controllers	15	4
Optional unit	4034: Computer-Aided Design (CAD) for Engineering	15	4
Optional unit	4035: Welding Technologies	15	4
Optional unit	4036: Welding Inspection	15	4
Optional unit	4037: Statistical Process Control	15	4
Optional unit	4038: Telecommunication Principles	15	4
Optional unit	4039: Semiconductor Manufacture*	15	4
Optional unit	4040: Semiconductor Production Environment*	15	4
Optional unit	4061: Programming for Engineers	15	4
Optional unit	4068: Industrial Robots	15	4
Optional unit	4086: Mechatronics Systems in Manufacturing	15	4
Optional unit	4089: Net Zero Energy Technologies I: Systems and Demand	15	4
Optional unit	4090: Engineering Science II	15	4

Unit descriptors can be found in the accompanying document *Unit Descriptors for the Pearson BTEC Higher Nationals Engineering Suite* at: https://qualifications.pearson.com/en/qualifications/btec-higher-nationals/engineering-2024-rqf.html.

Note 16: *Unit 4090: Engineering Science II* complements *Unit 4003: Engineering Science I* and meets the progression requirements of a range of UK and overseas universities. It is recommended to study *Engineering Science I* prior to *Engineering Science II*.

Note 17: *Optional unit also available as a specialist unit in particular pathways.

Table 10: Level 4 Optional Bank – Group 4

6.2.3 Pearson BTEC Level 5 Higher National Diploma in Engineering

- Requires 240 credits, of which 120 credits are at Level 5 and 120 credits are at Level 4
- Total qualification time = 2,400 hours
- Total guided learning hours = 960 hours
- Mix of core, specialist and optional units, totalling 240 credits.

6.2.4 Pearson BTEC Level 5 Higher National Diploma in Engineering (pathways and unit combinations)

6.2.4.1 Pearson BTEC Higher National Diploma in Engineering (General)

Pearson BTEC Higher National Diploma in Engineering (General)			
Level 4 units			
Unit type	**Unit**	**Credits**	**Level**
Core *Mandatory*	4002: Engineering Mathematics	15	4
Core *Mandatory*	4003: Engineering Science I	15	4
Core *Mandatory*	One unit from Core Unit Group 1 OR Core Unit Group 2 *(See Table 19 for Level 4 Core Unit Groups and the note on unit selection from the same group)*	15	4
Core *Mandatory*	One unit from Core Unit Group 1 OR Core Unit Group 2 *(See Table 19 for Level 4 Core Unit Groups and the note on unit selection from the same group)*	15	4
Plus **60 credits** from **any four** units from Level 4 Optional Bank: Group 4. **Note 18:** Centres are advised to offer *Unit 4061: Programming for Engineers* as an optional unit to meet growing sector needs and to assist with progression requirements.			

Level 5 units			
Unit type	**Unit**	**Credits**	**Level**
Core *Mandatory*	5002: Professional Engineering Management *This is a Pearson-set theme unit*	15	5
Plus one unit from the following list of project units			
Core *Mandatory*	5001: Research Project	30	5
Core *Mandatory*	5041: Engineering Project	15	5
Plus specialist units listed below			
Specialist *Mandatory*	5006: Further Engineering Mathematics*	15	5
Specialist *Mandatory*	5016: Lean Manufacturing*	15	5
Plus requisite number of optional units from Level 5 Optional Bank: Group 5 to achieve a total of 120 credits at Level 5. The combination of units selected **must not** replicate any other pathway or qualification. Certification claims will be ineligible if a barred combination of units is selected. **Note 19:** The number of Level 5 optional units depends on your choice of the project unit. • Two optional units if choosing *Unit 5001: Research Project*, which is a 30-credit unit. • Three optional units if choosing *Unit 5041: Engineering Project*, which is a 15-credit unit. **Note 20:** Students are permitted to undertake one Level 5 project unit only *(5001* or *5041)* for the Higher National Diploma award. **Note 21:** *Specialist units are available as mandatory or optional units for some other qualifications/pathways.			

Table 11: Pathway structure for Higher National Diploma in Engineering (General) at Level 5

6.2.4.2 Pearson BTEC Higher National Diploma in Engineering (Electrical and Electronic)

Pearson BTEC Higher National Diploma in Engineering (Electrical and Electronic)			
Level 4 units			
Unit type	**Unit**	**Credits**	**Level**
Core *Mandatory*	4002: Engineering Mathematics	15	4
Core *Mandatory*	4003: Engineering Science I	15	4
Core *Mandatory*	One unit from Core Unit Group 1 OR Core Unit Group 2 *(See Table 19 for Level 4 Core Unit Groups and the note on unit selection from the same group)*	15	4
Core *Mandatory*	One unit from Core Unit Group 1 OR Core Unit Group 2 *(See Table 19 for Level 4 Core Unit Groups and the note on unit selection from the same group)*	15	4
Specialist *Mandatory*	4019: Electrical and Electronic Principles*	15	4
Plus **45 credits** from **any three** units from Level 4 Optional Bank: Group 4. **Note 22:** Centres are advised to offer *Unit 4061: Programming for Engineers* as an optional unit to meet growing sector needs and to assist with progression requirements.			

Level 5 units			
Unit type	**Unit**	**Credits**	**Level**
Core *Mandatory*	5002: Professional Engineering Management *This is a Pearson-set theme unit*	15	5
Plus one unit from the following list of project units			
Core *Mandatory*	5001: Research Project	30	5
Core *Mandatory*	5041: Engineering Project	15	5
Plus specialist units listed below			
Specialist *Mandatory*	5006: Further Engineering Mathematics*	15	5
Specialist *Mandatory*	5011: Industrial Power, Electronics and Storage*	15	5
Specialist *Mandatory*	5010: Further Electrical Machines and Drives* **OR** 5019: Further Electrical, Electronic and Digital Principles* **OR** 5021: Further Control Systems Engineering*	15	5
Plus requisite number of optional units from Level 5 Optional Bank: Group 5 to achieve a total of 120 credits at Level 5. The combination of units selected **must not** replicate any other pathway or qualification. Certification claims will be ineligible if a barred combination of units is selected. **Note 23:** The number of Level 5 optional units depends on your choice of the project unit. • Two optional units if choosing *Unit 5001: Research Project*, which is a 30-credit unit. • Three optional units if choosing *Unit 5041: Engineering Project*, which is a 15-credit unit. **Note 24:** Students are permitted to undertake one Level 5 project unit only *(5001* or *5041)* for the Higher National Diploma award. **Note 25:** *Specialist units are available as mandatory or optional units for some other qualifications/pathways.			

Table 12: Pathway structure for Higher National Diploma in Engineering (Electrical and Electronic) at Level 5

6.2.4.3 Pearson BTEC Higher National Diploma in Engineering (Manufacturing)

Pearson BTEC Higher National Diploma in Engineering (Manufacturing)			
Level 4 units			
Unit type	**Unit**	**Credits**	**Level**
Core *Mandatory*	4002: Engineering Mathematics	15	4
Core *Mandatory*	4003: Engineering Science I	15	4
Core *Mandatory*	One unit from Core Unit Group 1 OR Core Unit Group 2 *(See Table 19 for Level 4 Core Unit Groups and the note on unit selection from the same group)*	15	4
Core *Mandatory*	One unit from Core Unit Group 1 OR Core Unit Group 2 *(See Table 19 for Level 4 Core Unit Groups and the note on unit selection from the same group)*	15	4
Specialist *Mandatory*	4014: Production Engineering for Manufacture	15	4
Specialist *Mandatory*	4017: Quality and Process Improvement*	15	4
Plus **30 credits** from **any two** units from Level 4 Optional Bank: Group 4. **Note 26:** Centres are advised to offer *Unit 4061: Programming for Engineers* as an optional unit to meet growing sector needs and to assist with progression requirements.			

Level 5 units			
Unit type	**Unit**	**Credits**	**Level**
Core *Mandatory*	5002: Professional Engineering Management *This is a Pearson-set theme unit*	15	5
Plus one unit from the following list of project units			
Core *Mandatory*	5001: Research Project	30	5
Core *Mandatory*	5041: Engineering Project	15	5
Plus specialist units listed below			
Specialist *Mandatory*	5015: Manufacturing Systems Engineering*	15	5
Specialist *Mandatory*	5016: Lean Manufacturing*	15	5
Specialist *Mandatory*	5017: Advanced Manufacturing Technology*	15	5
Plus requisite number of optional units from Level 5 Optional Bank: Group 5 to achieve a total of 120 credits at Level 5. The combination of units selected **must not** replicate any other pathway or qualification. Certification claims will be ineligible if a barred combination of units is selected. **Note 27:** The number of Level 5 optional units depends on your choice of the project unit. • Two optional units if choosing *5001: Research Project*, which is a 30-credit unit. • Three optional units if choosing *5041: Engineering Project*, which is a 15-credit unit. **Note 28:** Students are permitted to undertake one Level 5 project unit only *(5001* or *5041)* for the Higher National Diploma award. **Note 29:** *Specialist units are available as mandatory or optional units for some other qualifications/pathways.			

Table 13: Pathway structure for Higher National Diploma in Engineering (Manufacturing) at Level 5

6.2.4.4 Pearson BTEC Higher National Diploma in Engineering (Mechanical)

Pearson BTEC Higher National Diploma in Engineering (Mechanical)			
Level 4 units			
Unit type	**Unit**	**Credits**	**Level**
Core *Mandatory*	4002: Engineering Mathematics	15	4
Core *Mandatory*	4003: Engineering Science I	15	4
Core *Mandatory*	One unit from Core Unit Group 1 OR Core Unit Group 2 *(See Table 19 for Level 4 Core Unit Groups and the note on unit selection from the same group)*	15	4
Core *Mandatory*	One unit from Core Unit Group 1 OR Core Unit Group 2 *(See Table 19 for Level 4 Core Unit Groups and the note on unit selection from the same group)*	15	4
Specialist *Mandatory*	4008: Mechanical Principles	15	4
Specialist *Mandatory*	4013: Fundamentals of Thermodynamics and Heat Transfer*	15	4
Plus **30 credits** from **any two** units from Level 4 Optional Bank: Group 4. **Note 30:** If the student has no prior practical experience, then it is highly recommended that *Unit 4010: Mechanical Workshop Practices* is the selected optional unit**.** **Note 31:** Centres are advised to offer *Unit 4061: Programming for Engineers* as an optional unit to meet growing sector needs and to assist with progression requirements.			

Level 5 units			
Unit type	**Unit**	**Credits**	**Level**
Core *Mandatory*	5002: Professional Engineering Management *This is a Pearson-set theme unit*	15	5
Plus one unit from the following list of project units			
Core *Mandatory*	5001: Research Project	30	5
Core *Mandatory*	5041: Engineering Project	15	5
Plus specialist units listed below			
Specialist *Mandatory*	5003: Advanced Mechanical Principles	15	5
Specialist *Mandatory*	5004: Computational Modelling in Virtual Engineering*	15	5
Specialist *Mandatory*	5006: Further Engineering Mathematics*	15	5
Plus requisite number of optional units from Level 5 Optional Bank: Group 5 to achieve a total of 120 credits at Level 5. The combination of units selected **must not** replicate any other pathway or qualification. **Certification claims will be ineligible if a barred combination of units is selected.** **Note 32:** The number of Level 5 optional units depends on your choice of the project unit. • Two optional units if choosing *5001: Research Project*, which is a 30-credit unit. • Three optional units if choosing *5041: Engineering Project*, which is a 15-credit unit. **Note 33:** Students are permitted to undertake one Level 5 project unit only *(5001* or *5041)* for the Higher National Diploma award. **Note 34:** *Specialist units are available as mandatory or optional units for some other qualifications/pathways.			

Table 14: Pathway structure for Higher National Diploma in Engineering (Mechanical) at Level 5

6.2.4.5 Pearson BTEC Higher National Diploma in Engineering (Mechatronics)

Pearson BTEC Higher National Diploma in Engineering (Mechatronics)			
Level 4 units			
Unit type	**Unit**	**Credits**	**Level**
Core *Mandatory*	4002: Engineering Mathematics	15	4
Core *Mandatory*	4003: Engineering Science I	15	4
Core *Mandatory*	One unit from Core Unit Group 1 OR Core Unit Group 2 *(See Table 19 for Level 4 Core Unit Groups and the note on unit selection from the same group)*	15	4
Core *Mandatory*	One unit from Core Unit Group 1 OR Core Unit Group 2 *(See Table 19 for Level 4 Core Unit Groups and the note on unit selection from the same group)*	15	4
Specialist *Mandatory*	4006: Mechatronics*	15	4
Plus **45 credits** from **any three** units from Level 4 Optional Bank: Group 4. **Note 35:** Centres are advised to offer *Unit 4061: Programming for Engineers* as an optional unit to meet growing sector needs and to assist with progression requirements.			

Level 5 units			
Unit type	**Unit**	**Credits**	**Level**
Core *Mandatory*	5002: Professional Engineering Management *This is a Pearson-set theme unit*	15	5
Plus one unit from the following list of project units			
Core *Mandatory*	5001: Research Project	30	5
Core *Mandatory*	5041: Engineering Project	15	5
Plus specialist units listed below			
Specialist *Mandatory*	5006: Further Engineering Mathematics*	15	5
Specialist *Mandatory*	5021: Further Control Systems Engineering* OR 5042: Signals and Systems* OR 5048: Sensors and Automation*	15	5
Plus requisite number of optional units from Level 5 Optional Bank: Group 5 to achieve a total of 120 credits at Level 5. The combination of units selected **must not** replicate any other pathway or qualification. Certification claims will be ineligible if a barred combination of units is selected. **Note 36:** The number of Level 5 optional units depends on your choice of the project unit. • Two optional units if choosing *5001: Research Project*, which is a 30-credit unit. • Three optional units if choosing *5041: Engineering Project*, which is a 15-credit unit. **Note 37:** Students are permitted to undertake one Level 5 project unit only *(5001* or *5041)* for the Higher National Diploma award. **Note 38:** *Specialist units are available as mandatory or optional units for some other qualifications/pathways.			

Table 15: Pathway structure for Higher National Diploma in Engineering (Mechatronics) at Level 5

6.2.4.6 Pearson BTEC Higher National Diploma in Engineering (Operations)

Pearson BTEC Higher National Diploma in Engineering (Operations)			
Level 4 units			
Unit type	**Unit**	**Credits**	**Level**
Core *Mandatory*	4002: Engineering Mathematics	15	4
Core *Mandatory*	4003: Engineering Science I	15	4
Core *Mandatory*	One unit from Core Unit Group 1 OR Core Unit Group 2 *(See Table 19 for Level 4 Core Unit Groups and the note on unit selection from the same group)*	15	4
Core *Mandatory*	One unit from Core Unit Group 1 OR Core Unit Group 2 *(See Table 19 for Level 4 Core Unit Groups and the note on unit selection from the same group)*	15	4
Plus **60 credits** from **any four** units from Level 4 Optional Bank: Group 3. **Note 39:** Centres are advised to offer *Unit 4061: Programming for Engineers* as an optional unit to meet growing sector needs and to assist with progression requirements.			

Level 5 units			
Unit type	**Unit**	**Credits**	**Level**
Core *Mandatory*	5002: Professional Engineering Management *This is a Pearson-set theme unit*	15	5
Plus one unit from the following list of project units			
Core *Mandatory*	5001: Research Project	30	5
Core *Mandatory*	5041: Engineering Project	15	5
Plus specialist units listed below			
Specialist *Mandatory*	5006: Further Engineering Mathematics*	15	5
Specialist *Mandatory*	5022: Industrial Services	15	5
Specialist *Mandatory*	5023: Thermofluids*	15	5
Specialist *Mandatory*	5051: Heating, Ventilation, Air Conditioning (HVAC)	15	5
Plus requisite number of optional units from Level 5 Optional Bank: Group 5 to achieve a total of 120 credits at Level 5. The combination of units selected **must not** replicate any other pathway or qualification. Certification claims will be ineligible if a barred combination of units is selected. **Note 40:** The number of Level 5 optional units depends on your choice of the project unit. • Two optional units if choosing *Unit 5001: Research Project*, which is a 30-credit unit. • Three optional units if choosing *Unit 5041: Engineering Project*, which is a 15-credit unit. **Note 41:** Students are permitted to undertake one Level 5 project unit only *(5001* or *5041)* for the Higher National Diploma award. **Note 42:** *Specialist units are available as mandatory or optional units for some other qualifications/pathways.			

Table 16: Pathway structure for Higher National Diploma in Engineering (Operations) at Level 5

6.2.4.7 Pearson BTEC Higher National Diploma in Engineering (Semiconductor Technologies)

Pearson BTEC Higher National Diploma in Engineering (Semiconductor Technologies)			
Level 4 units			
Unit type	**Unit**	**Credits**	**Level**
Core *Mandatory*	4002: Engineering Mathematics	15	4
Core *Mandatory*	4003: Engineering Science I	15	4
Core *Mandatory*	One unit from Core Unit Group 1 OR Core Unit Group 2 *(See Table 19 for Level 4 Core Unit Groups and the note on unit selection from the same group)*	15	4
Core *Mandatory*	One unit from Core Unit Group 1 OR Core Unit Group 2 *(See Table 19 for Level 4 Core Unit Groups and the note on unit selection from the same group)*	15	4
Specialist *Mandatory*	4039: Semiconductor Manufacture*	15	4
Specialist *Mandatory*	4040: Semiconductor Production Environments*	15	4
Plus **30 credits** from **any two** units from Level 4 Optional Bank: Group 4. **Note 43:** Centres are advised to offer *Unit 4061: Programming for Engineers* as an optional unit to meet growing sector needs and to assist with progression requirements.			

Level 5 units			
Unit type	**Unit**	**Credits**	**Level**
Core *Mandatory*	5002: Professional Engineering Management *This is a Pearson-set theme unit*	15	5
Plus one unit from the following list of project units			
Core *Mandatory*	5001: Research Project	30	5
Core *Mandatory*	5041: Engineering Project	15	5
Plus specialist units listed below			
Specialist *Mandatory*	5024: Emerging Semiconductor Technologies*	15	5
Specialist *Mandatory*	5025: Semiconductor Integrated Electronics*	15	5
Plus requisite number of optional units from Level 5 Optional Bank: Group 5 to achieve a total of 120 credits at Level 5. The combination of units selected **must not** replicate any other pathway or qualification. Certification claims will be ineligible if a barred combination of units is selected. **Note 44:** The number of Level 5 optional units depends on your choice of the project unit. • Two optional units if choosing *5001: Research Project*, which is a 30-credit unit. • Three optional units if choosing *5041: Engineering Project*, which is a 15-credit unit. **Note 45:** Students are permitted to undertake one Level 5 project unit only *(5001* or *5041)* for the Higher National Diploma award. **Note 46:** *Specialist units are available as mandatory or optional units for some other qualifications/pathways.			

Table 17: Pathway structure for Higher National Diploma in Engineering (Semiconductor Technologies) at Level 5

6.2.4.8 Pearson BTEC Higher National Diploma in Engineering (Embedded Electronic Systems)

Pearson BTEC Higher National Diploma in Engineering (Embedded Electronic Systems)			
Level 4 units			
Unit type	**Unit**	**Credits**	**Level**
Core *Mandatory*	4002: Engineering Mathematics	15	4
Core *Mandatory*	4003: Engineering Science I	15	4
Core *Mandatory*	One unit from Core Unit Group 1 OR Core Unit Group 2 *(See Table 19 for Level 4 Core Unit Groups and the note on unit selection from the same group)*	15	4
Core *Mandatory*	One unit from Core Unit Group 1 OR Core Unit Group 2 *(See Table 19 for Level 4 Core Unit Groups and the note on unit selection from the same group)*	15	4
Specialist *Mandatory*	4019: Electrical and Electronic Principles*	15	4
Plus **45 credits** from **any three** units from Level 4 Optional Bank: Group 4. **Note 47:** Centres are advised to offer *Unit 4061: Programming for Engineers* as an optional unit to meet growing sector needs and to assist with progression requirements.			

Level 5 units			
Unit type	**Unit**	**Credits**	**Level**
Core *Mandatory*	5002: Professional Engineering Management *This is a Pearson-set theme unit*	15	5
Plus one unit from the following list of project units			
Core *Mandatory*	5001: Research Project	30	5
Core *Mandatory*	5041: Engineering Project	15	5
Plus specialist units listed below			
Specialist *Mandatory*	5006: Further Engineering Mathematics*	15	5
Specialist *Mandatory*	5007: Commercial Programming Software*	15	5
Specialist *Mandatory*	5013: Embedded Systems*	15	5

Plus requisite number of optional units from Level 5 Optional Bank: Group 5 to achieve a total of 120 credits at Level 5.

The combination of units selected **must not** replicate any other pathway or qualification. Certification claims will be ineligible if a barred combination of units is selected.

Note 48: The number of Level 5 optional units depends on your choice of the project unit.

- Two optional units if choosing *5001: Research Project*, which is a 30-credit unit.
- Three optional units if choosing *5041: Engineering Project*, which is a 15-credit unit.

Note 49: Students are permitted to undertake one Level 5 project unit only *(5001* or *5041)* for the Higher National Diploma award.

Note 50: The prerequisite pathway for students studying the Embedded Electronic Systems pathway at Level 5 is the Electrical and Electronic Engineering pathway at Level 4. RPL can be used to consider any other alternative pathway/qualification that would allow students to study the same core and specialist units at Level 4. For example, HNC in Automation and Control Engineering or HNC in Electrical Systems Engineering or HNC in Electronic Systems Engineering.

Note 51: *Specialist units are available as mandatory or optional units for some other qualifications/pathways.

Table 18: Pathway structure for Higher National Diploma in Engineering (Embedded Electronic Systems) at Level 5

6.2.4.9 Pearson BTEC Higher National Diploma in Engineering Level 5 Optional Bank

Higher National Diploma in Engineering (Electrical and Electronic) **Higher National Diploma in Engineering (General)** **Higher National Diploma in Engineering (Manufacturing)** **Higher National Diploma in Engineering (Mechanical)** **Higher National Diploma in Engineering (Mechatronics)** **Higher National Diploma in Engineering (Operations)** **Higher National Diploma in Engineering (Semiconductor Technologies)** **Higher National Diploma in Engineering (Embedded Electronic Systems)**			
Unit type	**Unit**	**Credits**	**Level**
Core Unit Group 1 *Note: All units in Group 1 must be taken at Level 4 for progression purposes.*			
Core *Mandatory*	4001: Engineering Design	15	4
Core *Mandatory*	4004: Managing a Professional Engineering Project *This is a Pearson-set theme unit.*	15	4
Core Unit Group 2 *Note: All units in Group 2 must be taken at Level 4 for progression purposes.*			
Core *Mandatory*	4062: Professional Engineering Practice *This is a Pearson-set theme unit.*	15	4
Core *Mandatory*	4063: Engineering Mechanics and Materials	15	4
Note 52: Core Unit Group 1 continues to offer the same units from the Engineering qualification to ensure continuity and smooth progression or programme transfers for students. **Note 53:** Core Unit Group 2 offers a different combination of units in support of the new engineering qualifications introduced in 2022 to ensure flexibility, with more choice and programme transfers between the qualifications.			

Table 19: Level 4 Core Unit Groups

Pearson BTEC Level 5 Higher National Diploma in Engineering (Operations)			
Optional unit	4018: Maintenance Engineering	15	4
Optional unit	4024: Electro, Pneumatic and Hydraulic Systems	15	4
Optional unit	4025: Operations and Plant Management	15	4
Optional unit	4026: Electrical Systems and Fault Finding	15	4
Optional unit	4027: CAD for Schematics in Maintenance Engineering	15	4
Optional unit	4061: Programming for Engineers	15	4

Table 20: Level 4 Optional Bank – Group 3

Higher National Diploma in Engineering (Electrical and Electronic) Higher National Diploma in Engineering (General) Higher National Diploma in Engineering (Manufacturing) Higher National Diploma in Engineering (Mechanical) Higher National Diploma in Engineering (Mechatronics) Higher National Diploma in Engineering (Semiconductor Technologies)			
Optional unit	4005: Renewable Energy	15	4
Optional unit	4007: Machining and Processing of Engineering Materials	15	4
Optional unit	4008: Mechanical Principles*	15	4
Optional unit	4009: Materials, Properties and Testing	15	4
Optional unit	4010: Mechanical Workshop Practices	15	4
Optional unit	4011: Fluid Mechanics	15	4
Optional unit	4012: Engineering Management	15	4
Optional unit	4013: Fundamentals of Thermodynamics and Heat Transfer*	15	4
Optional unit	4014: Production Engineering for Manufacture*	15	4
Optional unit	4015: Automation, Robotics and Programmable Logic Controllers (PLCs)	15	4
Optional unit	4016: Instrumentation and Control Systems	15	4
Optional unit	4017: Quality and Process Improvement*	15	4
Optional unit	4018: Maintenance Engineering	15	4
Optional unit	4019: Electrical and Electronic Principles*	15	4
Optional unit	4020: Digital Principles	15	4
Optional unit	4021: Electrical Machines	15	4
Optional unit	4022: Electronic Circuits and Devices*	15	4
Optional unit	4023: Computer-Aided Design and Manufacture (CAD/CAM)	15	4
Optional unit	4024: Electro, Pneumatic and Hydraulic Systems	15	4
Optional unit	4025: Operations and Plant Management	15	4
Optional unit	4026: Electrical Systems and Fault Finding	15	4

Optional unit	4027: CAD Schematics for Maintenance Engineering	15	4
Optional unit	4028: Materials Engineering with Polymers	15	4
Optional unit	4029: Polymer Manufacturing Processes	15	4
Optional unit	4030: Industry 4.0	15	4
Optional unit	4031: Introduction to Professional Engineering Management	15	4
Optional unit	4033: Programmable Logic Controllers	15	4
Optional unit	4034: Computer-Aided Design (CAD) for Engineering	15	4
Optional unit	4035: Welding Technologies	15	4
Optional unit	4036: Welding Inspection	15	4
Optional unit	4037: Statistical Process Control	15	4
Optional unit	4038: Telecommunication Principles	15	4
Optional unit	4039: Semiconductor Manufacture*	15	4
Optional unit	4040: Semiconductor Production Environment*	15	4
Optional unit	4061: Programming for Engineers	15	4
Optional unit	4068: Industrial Robots	15	4
Optional unit	4086: Mechatronics Systems in Manufacturing	15	4
Optional unit	4089: Net Zero Energy Technologies I: Systems and Demand	15	4
Optional unit	4090: Engineering Science II	15	4

Table 21: Level 4 Optional Bank – Group 4

Higher National Diploma in Engineering (Electrical and Electronic) Higher National Diploma in Engineering (General) Higher National Diploma in Engineering (Manufacturing) Higher National Diploma in Engineering (Mechanical) Higher National Diploma in Engineering (Mechatronics) Higher National Diploma in Engineering (Operations) Higher National Diploma in Engineering (Semiconductor Technologies) Higher National Diploma in Engineering (Embedded Electronic Systems)			
Optional unit	5003: Advanced Mechanical Principles*	15	5
Optional unit	5004: Computational Modelling in Virtual Engineering*	15	5
Optional unit	5005: Further Thermodynamics	15	5
Optional unit	5006: Further Engineering Mathematics*	15	5
Optional unit	5007: Commercial Programming Software*	15	5
Optional unit	5008: Distributed Control Systems	15	5
Optional unit	5009: Further Programmable Logic Controllers (PLCs)	15	5
Optional unit	5010: Further Electrical Machines and Drives	15	5
Optional unit	5011: Industrial Power, Electronics and Storage*	15	5
Optional unit	5012: Industrial Systems*	15	5
Optional unit	5013: Embedded Systems*	15	5
Optional unit	5014: Analogue Electronic Systems	15	5
Optional unit	5015: Manufacturing Systems Engineering*	15	5
Optional unit	5016: Lean Manufacturing*	15	5
Optional unit	5017: Advanced Manufacturing Technology*	15	5
Optional unit	5018: Sustainability	15	5
Optional unit	5019: Further Electrical, Electronic and Digital Principles	15	5
Optional unit	5020: Utilisation of Electrical Power	15	5
Optional unit	5021: Further Control Systems Engineering	15	5
Optional unit	5022: Industrial Services*	15	5
Optional unit	5023: Thermofluids*	15	5

Optional unit	5024: Emerging Semiconductor Technologies*	15	5
Optional unit	5025: Semiconductor Integrated Electronics*	15	5
Optional unit	5042: Signals and Systems*	15	5
Optional unit	5048: Sensors and Automation*	15	5
Optional unit	5051: Heating, Ventilation, Air Conditioning (HVAC)*	15	5
Optional unit	5054: Net Zero Energy Technologies II: Infrastructure and Pathways	15	5
Unit descriptors can be found in the accompanying document *Unit Descriptors for the Pearson BTEC Higher Nationals Engineering Suite* at: https://qualifications.pearson.com/en/qualifications/btec-higher-nationals/engineering-2024-rqf.html. **Note 54:** *Unit 4090: Engineering Science II* complements *Unit 4003: Engineering Science I* and meets the progression requirements of a range of UK and overseas universities. It is recommended to study *Engineering Science I* prior to *Engineering Science II.* **Note 55:** *Optional unit also available as a specialist unit in particular pathways.			

Table 22: Level 5 Optional Bank: Group 5

6.2.5 Meeting local needs

When developing our Pearson BTEC Higher National qualifications, we consulted centres, employers and professional organisations. We designed the units to meet the skill needs of the sector and to cover the full range of employment opportunities it offers. You should make full use of the choices available to you within the specialist pathways to meet the needs of your students and local skills and training needs.

If you find the units that we offer do not meet a certain need, you can apply to import units from other Regulated Qualifications Framework (RQF) Pearson BTEC Higher National qualifications through the Meeting Local Needs (MLN) process. You will need to justify your reasons for using these other units. Your application must be in before 31 January of the calendar year in which you want to use the units. For more information, please visit: https://qualifications.pearson.com/en/qualifications/btec-higher-nationals/higher-nationals/meeting-local-needs.html or contact your Pearson regional contact.

There are some restrictions on importing units from other RQF Pearson BTEC Higher National qualifications.

- For the RQF Pearson BTEC HNC qualification, a maximum of 30 credits can be imported into the optional unit allowance.
- For the RQF Pearson BTEC HND qualification, a maximum of 60 credits can be imported; 30 credits at Level 4 and 30 credits at Level 5.
- You cannot use MLN units to replace mandatory units in any qualification.
- You must still follow the qualification's rules of combination.

Table 23 shows the maximum number of credits you can import by pathway for our Pearson BTEC Higher Nationals in Engineering and other engineering qualifications.

Qualification	Main title/pathway	Import at Level 4	Import at Level 5
Pearson BTEC Level 4 Higher National Certificate in Engineering *Note: Applies to all specified pathways*	Electrical and Electronic	30	N/A
	General	30	N/A
	Manufacturing	30	N/A
	Mechanical	30	N/A
	Mechatronics	30	N/A
	Operations	30	N/A
	Semiconductor Technologies	30	N/A

Qualification	Main title/pathway	Import at Level 4	Import at Level 5
Pearson BTEC Level 5 Higher National Diploma in Engineering *Note: Applies to all specified pathways*	Electrical and Electronic	30	30
	Embedded Electronic Systems	30	30
	General	30	30
	Manufacturing	30	30
	Mechanical	30	30
	Mechatronics	30	30
	Operations	30	30
	Semiconductor Technologies	30	30

Table 23: Maximum number of credits available to import for engineering qualifications per pathway

6.2.6 Commissioning new units for Pearson BTEC Higher Nationals

If the MLN process does not provide enough flexibility in terms of qualification structure, you can ask us to develop new units to meet your needs. You will need to fill in an application form explaining the reasons for your request. You must apply a full year ahead of the year in which you want to deliver the new unit.

If we agree to your application, we will develop the new unit in consultation with you.

We would be pleased to discuss your ideas for commissioning new units. For more information, please see the custom-designed Higher Nationals section of our website at: https://qualifications.pearson.com/en/qualifications/btec-higher-nationals/about/building-a-bespoke-btec-higher-national-qualification.html.

6.3 Unit numbering and corresponding qualifications

Some units within this qualification have been selected from the other engineering Pearson BTEC Higher National specifications, namely the Engineering (2018, Issue 1), Computer Systems Engineering (2022, Issue 1) and Space Technologies (2022, Issue 1) qualifications. Unit numbers are revised in this specification to indicate the level of study (4 series for Level 4 units and 5 series for Level 5 units). Table 24 gives details of the unit numbers in this specification and the corresponding unit number as it appears in the previous specification of this qualification and the other Pearson BTEC Higher National engineering specifications.

Current and previous specification unit numbers and titles			
Unit number		**Unit title**	**Unit code**
Higher Nationals in Engineering (Issue 1, 2018)	**This specification (Issue 2, 2024)**		
1	4001	4001: Engineering Design	K/615/1475
2	4002	4002: Engineering Mathematics	M/615/1476
3	4003	4003: Engineering Science I	T/615/1477
4	4004	4004: Managing a Professional Engineering Project	A/615/1478
5	4005	4005: Renewable Energy	F/615/1479
6	4006	4006: Mechatronics	T/615/1480
7	4007	4007: Machining and Processing of Engineering Materials	F/615/1481
8	4008	4008: Mechanical Principles	F/615/1482
9	4009	4009: Materials, Properties and Testing	J/615/1483
10	4010	4010: Mechanical Workshop Practices	L/615/1484
11	4011	4011: Fluid Mechanics	R/615/1485
12	4012	4012: Engineering Management	Y/615/1486
13	4013	4013: Fundamentals of Thermodynamics and Heat Transfer	D/615/1487
14	4014	4014: Production Engineering for Manufacture	H/615/1488

15	4015	4015: Automation, Robotics and Programmable Logic Controllers (PLCs)	K/615/1489
16	4016	4016: Instrumentation and Control Systems	D/615/1490
17	4017	4017: Quality and Process Improvement	H/615/1491
18	4018	4018: Maintenance Engineering	K/615/1492
19	4019	4019: Electrical and Electronic Principles	M/615/1493
20	4020	4020: Digital Principles	T/615/1494
21	4021	4021: Electrical Machines	A/615/1495
22	4022	4022: Electronic Circuits and Devices	F/615/1496
23	4023	4023: Computer-Aided Design and Manufacture (CAD/CAM)	J/615/1497
29	4024	4024: Electro, Pneumatic and Hydraulic Systems	L/615/1498
30	4025	4025: Operations and Plant Management	R/615/1499
31	4026	4026: Electrical Systems and Fault Finding	A/615/1500
32	4027	4027: CAD for Schematics in Maintenance Engineering	F/615/1501
73	4028	4028: Materials Engineering with Polymers	M/616/2556
74	4029	4029: Polymer Manufacturing Processes	M/616/2557
75	4030	4030: Industry 4.0	F/617/3949
76	4031	4031: Introduction to Professional Engineering Management	R/617/3938
78	4033	4033: Programmable Logic Controllers	Y/617/3942
79	4034	4034: Computer-Aided Design (CAD) for Engineering	M/617/6409
80	4035	4035: Welding Technologies	D/617/7586
81	4036	4036: Welding Inspection	H/617/7587
82	4037	4037: Statistical Process Control	R/617/3924

83	4038	4038: Telecommunication Principles	K/618/1785
84	4039	4039: Semiconductor Manufacture	L/618/1763
85	4040	4040: Semiconductor Production Environment	R/618/1764
N/A	4061*****	4061: Programming for Engineers	A/650/2923
N/A	4062*****	4062: Professional Engineering Practice	J/650/2927
N/A	4063*****	4063: Engineering Mechanics and Materials	F/650/2943
77	4068	4068: Industrial Robots	L/617/3940
N/A	4089*****	4089: Net Zero Energy Technologies I: Systems and Demand	K/650/3369
N/A	4090	4090: Engineering Science II	M/650/9509
34	5001	5001: Research Project	J/615/1502
35	5002	5002: Professional Engineering Management	L/615/1503
36	5003	5003: Advanced Mechanical Principles	R/615/1504
37	5004	5004: Computational Modelling in Virtual Engineering	Y/615/1505
38	5005	5005: Further Thermodynamics	D/615/1506
39	5006	5006: Further Engineering Mathematics	H/615/1507
40	5007	5007: Commercial Programming Software	K/615/1508
41	5008	5008: Distributed Control Systems	M/615/1509
42	5009	5009: Further Programmable Logic Controllers (PLCs)	H/615/1510
43	5010	5010: Further Electrical Machines and Drives	K/615/1511
44	5011	5011: Industrial Power, Electronics and Storage	M/615/1512
45	5012	5012: Industrial Systems	T/615/1513
46	5013	5013: Embedded Systems	A/615/1514

47	5014	5014: Analogue Electronic Systems	F/615/1515
48	5015	5015: Manufacturing Systems Engineering	J/615/1516
49	5016	5016: Lean Manufacturing	L/615/1517
50	5017	5017: Advanced Manufacturing Technology	R/615/1518
51	5018	5018: Sustainability	Y/615/1519
52	5019	5019: Further Electrical, Electronic and Digital Principles	L/615/1520
53	5020	5020: Utilisation of Electrical Power	R/615/1521
54	5021	5021: Further Control Systems Engineering	Y/615/1522
63	5022	5022: Industrial Services	K/615/1525
64	5023	5023: Thermofluids*	M/615/1526
86	5024	5024: Emerging Semiconductor Technologies	Y/618/1765
87	5025	5025: Semiconductor Integrated Electronics	D/618/1766
N/A	5041*****	5041: Engineering Project	M/650/2948
N/A	5042*	5042: Signals and Systems	M/650/2984
N/A	5048*	5048: Sensors and Automation	J/650/2990
62	5051	5051: Heating, Ventilation, Air Conditioning (HVAC)*	H/615/1524
N/A	5054*****	5054: Net Zero Energy Technologies II: Infrastructure and Pathways	Y/650/3372

***** Units from other engineering qualifications

Note 56: Level 4 Engineering Maths is retitled as Engineering Mathematics.

Note 57: Level 4 Engineering Science is retitled as Engineering Science I.

Note 58: Level 4 Fundamentals of Thermodynamics and Heat Engines is retitled as Fundamentals of Thermodynamics and Heat Transfer.

Note 59: Level 5 Virtual Engineering is retitled as Computational Modelling in Virtual Engineering

Note 60: Level 5 Further Mathematics is retitled as Further Engineering Mathematics

Table 24: Current and previous specification unit numbers and titles

6.4 Pearson-set units

Pearson-set theme units form part of the core units. Pearson will decide on a theme each year.

It is a formal requirement that centres must:

- apply the theme to Level 4 and Level 5 units, and
- develop an assignment, to be internally assessed, to involve students in work related to the theme.

You will find support in the Pearson-set assignment guidance for the units and the theme and topic release documentation, which will be provided for each level, on HN Global at: https://hnglobal.highernationals.com/.

The Pearson-set unit provides a common framework for centres to develop work that will allow us to:

- compare information across the sector and
- identify and share best practice in higher education teaching and learning.

We will share the best practice results with all centres.

For more information about assessing Pearson-set units, please see *Section 7*.

6.5 Unit descriptor example

The unit descriptor is how we define the individual units of study that make up a Higher National qualification. Students will complete the units included in the programme that you offer at your centre.

You can use any of the unit descriptors in the accompanying document, *Unit Descriptors for the Pearson BTEC Higher Nationals Engineering Suite*, which can be found at: https://qualifications.pearson.com/en/qualifications/btec-higher-nationals/engineering-2024-rqf.html. We have described each part of the unit as follows:

Unit title	A general statement of what the unit will cover.
Unit code	The Ofqual unit reference number.
Unit type	There are three unit types: • core (mandatory to all pathways) • specialist (mandatory to specific pathways) • optional (available to most pathways).
Unit level	All our Pearson BTEC Higher National units are at Levels 4 or 5.
Credit value	The credit value relates to the total qualification time (TQT) and unit learning hours (ULH). It is easy to calculate: • 1 credit = 10 ULH • 15 credits = 150 ULH. To complete a Higher National Certificate or Higher National Diploma, students must achieve all of the credits required. Refer to *Section 7.5* in the programme specification.
Introduction	Some general notes on the unit: • setting the scene • stating the purpose and aim, and • outlining the topics to be learnt and skills gained through the unit.
Learning Outcomes	These clearly explain what students will be able to do after completing the unit. There are usually four Learning Outcomes for each unit.
Essential Content	This section covers the content that students can expect to study as they work towards achieving their Learning Outcomes.
Learning Outcomes and Assessment Criteria	Tutors can refer to this table when grading assignments. The table connects the unit's Learning Outcomes with the student's work. Assignments can be graded at 'Pass' (P), 'Merit' (M) and 'Distinction' (D), depending on the quality of the student's work.
Recommended Resources	This section lists the resources that students should use to support their study for the unit. It includes books, journals and online material. The programme tutor may also suggest resources, particularly for local information. It may also contain delivery requirements, e.g., specific equipment, case study material and learning resources depending on the subject.

Table 25: Unit descriptor components

6.5.1 Web resources – referencing

Some units have web resources as part of their Recommended Resources list. Hyperlinking to these resources directly can cause problems, as their locations and addresses may change. To avoid this problem we only link to the main page of the website and signpost students and tutors to the section where the resource can be found. We have therefore referenced web resources as follows:

[1] A link to the main page of the website

[2] The title of the site

[3] The section of the website where the resource can be found

[4] The type of resource it is, for example:

- research
- general reference
- tutorials
- training
- e-books
- report
- wiki
- article
- datasets
- development tool
- discussion forum.

Example

[1] www.theiet.org

[2] 5G An overview and an update

[3] Events

[4] (General reference)

Students and tutors must use a referencing system to cite and reference resources in an academic format.

7.0 Assessment

Pearson BTEC Higher Nationals are assessed using a combination of:

- centre-developed internal assignments that are set and assessed by centres, and
- Pearson-set theme unit assignments, which are set by centres in line with our guidelines and graded by centres.

Pearson-set theme units are mandatory and target particular industry-specific skills. The number and value of these units are dependent on qualification size.

- For the HNC, centres will assess one compulsory Pearson-set theme unit targeted at particular skills. This is a Level 4 core unit carrying 15 credits.
- For the HND, centres will assess two compulsory Pearson-set theme units targeted at particular skills:
    - one Level 4 core unit carrying 15 credits
    - one Level 5 core unit carrying 15 credits.

All other units are assessed through internal assignments set by the centre.

7.1 Principles of internal assessment

This section summarises the main features of internal assessment and explains how you can offer it effectively. Full details are given in the *BTEC Higher Nationals Centre Guide to Quality Assurance and Assessment* handbook, downloadable in the enhanced quality assurance section of our website: https://qualifications.pearson.com/en/qualifications/btec-higher-nationals/about/quality-assurance-process.html. All of your assessment team will need to refer to this document.

For Pearson BTEC Higher Nationals, you must meet the expectations of stakeholders and the needs of students by providing a programme that is practical and applied. You can tailor programmes to meet local needs and should use links with local employers and the wider business sector.

Effective internal assessment is challenging, engaging, practical and up to date. It must also be fair to all students and meet national standards.

7.1.1 Assessment through assignments

For internally assessed units, assessment takes the form of an assignment carried out after the unit (or part of the unit if several assignments are used) has been delivered. An assignment may take a variety of forms, including practical and written. It is a distinct activity completed independently by students (alone or in a team). It is separate from teaching, practice, exploration and other activities that students complete with direction from tutors.

Students should receive each assignment as an Assignment Brief with a hand-out date, a completion date and clear requirements for the evidence they must provide. There may also be specific practical activities that the student must complete under tutor observation as part of the assignment. Assignments can be divided into separate parts and may require several forms of evidence. A valid assignment will enable a clear and formal assessment grade based on the assessment criteria.

7.1.2 Using unit-based criteria

You must base your assessment decisions for Pearson BTEC Higher Nationals on the specific criteria we have provided for each unit and grade level. We have based these criteria on a framework to make sure that standards are consistent in the qualification and across the whole range of qualifications. We have developed each unit to assess the student's understanding, practical skills and the vocational qualities necessary for the qualification.

The assessment criteria for a unit are based on a hierarchy. For example, if a Merit criterion requires the student to show 'analyses' and the related Pass criterion requires the student to 'explain', then to gain a Merit the student will need to cover both 'explain' and 'analyses'. The unit assessment grid shows the relationships among the criteria so that assessors can apply all the criteria to the student's evidence at the same time.

Assessors must show how they have reached their decisions using the criteria in the assessment records. When a student has completed all the assessments for a unit, the assessment team can give a grade for the unit. This grade is based on the highest level the student is judged to have met for all the criteria.

- To achieve a Pass, a student must have met all the Pass criteria for the Learning Outcomes, demonstrating that they have covered the unit content and achieved Level 4 or 5 of the national framework.
- To achieve a Merit, a student must have met all the Merit criteria (and the Pass criteria) through high performance in each Learning Outcome.
- To achieve a Distinction, a student must have met all the Distinction criteria (and the Pass and Merit criteria), demonstrating outstanding performance across the whole unit.

A Pass cannot be awarded just because the student has completed all the assignments. Students must meet all of the Pass criteria. If they do not, their grade should be reported as 'unclassified'.

7.1.3 The assessment team

You will need an effective team for internal assessment. There are three key roles involved, each with different responsibilities. These roles are listed below.

- The **Programme Leader** is responsible for the programme, its assessment and internal monitoring to meet our requirements. They must register with us each year. They are also responsible for:
  - record-keeping
  - liaising with the standards verifier
  - acting as an assessor
  - supporting the rest of the assessment team
  - making sure that the team has the information it needs about our assessment requirements
  - organising training, and
  - using our guidance and support materials.
- **Internal Verifiers** oversee all assessment activity with the programme leader. They check that assignments and assessment decisions are valid and meet our requirements. All internal verifiers will follow the same standards and procedures as instructed by your programme leader. Internal verifiers are usually also assessors, but they do not verify their own assessments.
- **Assessors** set assignments or use assignments to assess students to national standards. Before taking any assessment decisions, they are trained by the programme leader to all work to the same standards and procedures. They also work with the programme leader and internal verifiers to make sure the assessment is planned and carried out in line with our requirements.

Our external examiner will sample student work across your assessors. They will also want to see evidence of how you have verified assignments and will assess your decisions.

Full information is provided in the *BTEC Higher Nationals Centre Guide to Quality Assurance and Assessment*, available in the 'Enhanced quality assurance' section of our website: https://qualifications.pearson.com/en/qualifications/btec-higher-nationals/about/quality-assurance-process.html.

7.1.4 Effective organisation

Internal assessment needs to be well organised so that you can track student progress and so that we can make sure your assessments are in line with national standards. It is particularly important that you manage the overall assignment programme and deadlines to make sure that all your students can complete their assignments on time.

When developing an overall plan for delivering and assessing your programme, you will need to consider:

- the order in which you deliver units
- whether delivery will take place over short or long periods of time, and
- when assessment can take place.

We support you in this through:

- assessment and feedback guidance documents available on HN Global, and
- training materials and sample templates for curriculum planning.

Please also see the *BTEC Higher Nationals Centre Guide to Quality Assurance and Assessment*, available in the enhanced quality assurance section of our website: https://qualifications.pearson.com/en/qualifications/btec-higher-nationals/about/quality-assurance-process.html.

7.1.5 Preparing students

You need to make sure that your students understand their responsibilities for assessment and the centre's arrangements. From induction onwards, you will want to make sure that students are motivated to work consistently and independently to achieve their qualifications. They need to understand:

- how assignments are used
- the importance of meeting assignment submission deadlines, and
- that all the work submitted for assessment must be their own.

To support them, you should provide a guide that explains:

- how you use assignments for assessment
- how assignments relate to the teaching programme
- how to use and reference source materials, including how to avoid plagiarism, and
- your centre's approach to assessments – for example how students must submit assignments, what happens if they submit late work and how they can request an extended deadline in special circumstances.

7.2 Formative assessment and feedback

7.2.1 Frequency and timing of formative assessment

Pearson does not define a minimum or maximum number of formative assessment points. However, students should have some formative assessment for each assignment, in order to provide them with an understanding of their progress and to identify areas for continued development.

Formative assessment that is too frequent can be detrimental to students' development. It can create an environment where students are working to produce something with the formative assessment in mind rather than using the outcomes of formative assessment to support their learning and development towards the summative assessment. In addition, too much formative assessment risks becoming 'coaching' as students will have time to respond only to what has been indicated in formative feedback.

Therefore, the frequency of formative feedback should be considered carefully, as part of an overall curriculum plan, so it occurs at points where there is a clear benefit for the student in gaining further insight into their development and progress.

The timing of formative assessment should also be considered. Formative assessment that is too close to a summative assessment does not provide effective learning for the student. With limited time between formative and summative assessment there is less opportunity for the student to make effective use of the feedback from formative assessment to address any issues in the work towards summative assessment. Again, there is a risk that the feedback from formative assessment becomes simply instructions (coaching) for the student.

Care should be taken to ensure that formative assessment takes place with sufficient time for the student to reflect on the feedback from the formative assessment and make whatever adjustments they deem necessary to improve their future work or performance towards summative assessment.

It is important to recognise that formative assessment can, in some cases, be continuous, depending on the learning and teaching strategy that has been adopted for a unit or programme. For example, where students are undertaking a large project, which they are working on throughout the semester/term, you may have regular tutorials (either group or individual) to review work-in-progress and provide students with feedback that helps them to understand their progress and development. In this context, the tutorials are a form of continuous formative assessment. The feedback from these tutorials still needs to avoid coaching and tutors should plan for tutorials (formative assessment) to stop at a point where there is sufficient time, before the summative assessment, to make effective use of the feedback in the later tutorials.

Please also see the *BTEC Higher Nationals Centre Guide to Quality Assurance and Assessment*, which can be found on our website: https://qualifications.pearson.com/en/qualifications/btec-higher-nationals/about/quality-assurance-process.html.

7.2.2 Formative feedback

While assessment and feedback always constitute a part of the student's learning, the purpose of assessment will vary, depending on when it is undertaken and the aim of the assessment activity.

Formative assessment feedback is given to students during the learning journey. This is to say that it relates to formative assessment that may be undertaken, at any point, prior to the summative assessment. Just as formative assessment is undertaken to support students to understand their progress, the associated feedback must be aimed at helping the student to recognise their current position and how to move forwards.

Formative assessment should always result in qualitative feedback, not a grade. When giving formative assessment feedback it is important to avoid giving students advice that directly informs the work that they may do for summative assessment. This is referred to as 'coaching' and is inappropriate. Feedback should provide students with general advice on how to progress in their studies, but should not tell them what to do. For example, a tutor might say:

'Your analysis of the research is not clear, you will need to look at the research more critically…'

rather than:

'What you should be writing is…'

In the former, the tutor is supporting the student to understand their current progress and how to improve, while the latter is 'coaching' the student.

Formative assessment can be either formal or informal. You might schedule specific points where students present work for formative assessment. Such instances can be valuable opportunities for group discussion and peer assessment. In such cases, it is expected that students will receive written formative assessment feedback. In other instances, the formative assessment feedback may be during tutorials or classroom activities.

Please also see the *BTEC Higher Nationals Centre Guide for Quality Assurance and Assessment*, which can be found on our website: https://qualifications.pearson.com/en/qualifications/btec-higher-nationals/about/quality-assurance-process.html.

7.3 Making valid assessment decisions

7.3.1 Authentic student work

An assessor must assess only student work that is authentic – in other words, the student's own independent work. Students must sign a declaration for each assessment to confirm that it is their own work. This declaration must confirm that:

- any evidence submitted for the assignment is the student's own, and
- the student understands that if this is not the case, they may face penalties for malpractice.

Assessors must make sure that evidence is authentic by setting valid assignments and supervising students during the assessment period. Assessors must also take care not to provide direct input, instructions or specific feedback that may influence the student's work and final grade.

You can use Pearson templates or your own templates to document authentication.

If your assessor suspects that a student's evidence is not authentic, they must take action in line with our policies for malpractice. Please see *Section 5.7* for more information.

7.3.2 Making assessment decisions using criteria

Assessors must use our criteria to make assessment decisions. They can judge the evidence from a student using all the relevant criteria at the same time but they must be satisfied that there is enough detailed evidence for each criterion required. For example, including a concluding section may not be enough evidence to meet the criterion requiring 'evaluation'.

Assessors should use the information and support available to help them reach their decisions. This includes:

- examples of moderated assessed work, and
- their programme leader and assessment team's experience.

7.3.3 Dealing with late assignments

For assessment to be fair, it is important that students are all assessed in the same way and that some students are not given an advantage by having extra time or the opportunity to learn from others. You should develop and publish your own regulations on late assignments and circumstances where you may agree to an extension.

Students must understand your policy on completing assignments by the deadlines you give them. You may agree to extend a deadline for a genuine reason, such as illness, in line with your centre policies. Please see *Section 5.6* for more information.

You can apply a penalty to assignments that are submitted late. To do this, you should:

- assess the assignment normally
- apply the penalty or cap to the grade awarded
- tell the student their uncapped grade to recognise the learning they have achieved and provide genuine assessment feedback
- record both the uncapped and capped grades, and
- have both grades verified by a suitable assessment board, taking into account any genuine reasons for the assignment being late.

Please also see the *BTEC Higher Nationals Centre Guide to Quality Assurance and Assessment*, which can be found on our website: https://qualifications.pearson.com/en/qualifications/btec-higher-nationals/about/quality-assurance-process.html.

7.3.4 Providing assessment decisions and feedback

Once your assessment team has completed the assessment process for an assignment, they will provide a formal assessment decision. This should be recorded formally and reported to the student. The information given to the student:

- must show the formal decision and how it has been reached, including how assessment criteria have been met
- may show why they have not demonstrated achievement against assessment criteria
- must not provide feedback on how to improve evidence, and
- may provide feedback on how to improve in the future.

7.3.5 The opportunity to resubmit an assignment

If a student's assignment does not pass after the first assessment, they must have the opportunity to resubmit the assignment for reassessment. In this case:

- students can have the assignment reassessed once only
- if coursework and project-based or portfolio-based assignments need to be reassessed, this will usually involve carrying out the original activity again
- for examinations, reassessment will involve completing a new activity
- the grade for a reassessed assignment will be capped at a Pass, and
- assignments already graded at a Pass or higher cannot be reassessed.

7.3.6 Repeat units

If a student fails to achieve a Pass for a unit following reassessment, your assessment board may agree that they can repeat the unit. In this case:

- the student must pay the unit fee and study the unit again, with full attendance, and
- the grade for the unit (if successfully completed) will be capped at a Pass.

Students can repeat a unit once only.

7.3.7 Assessment boards

It is a formal Pearson requirement that centres hold an assessment board for all your Pearson BTEC Higher National programmes. The main purpose of an assessment board is to make recommendations on:

- the grades achieved by students on the units
- extenuating circumstances
- cases of cheating and plagiarism
- students progressing to the next stage of the programme
- the awards to be made to students, and
- students resubmitting assignments and repeating units.

Assessment boards may also monitor academic standards. The main board meetings normally take place at the end of the session, but if your centre operates on a semester system there may be meetings at the end of the first semester. There may also be separate meetings to deal with referrals.

If you do not have an assessment board, our external examiner will discuss this with your quality nominee and programme leader. Assessment board reports and minutes provide valuable evidence of your quality assurance processes.

7.4 Planning and record-keeping

For internal processes to be effective, your assessment team needs to be well organised and keep effective records. We will work closely with you to make sure you are meeting national standards. This process gives stakeholders confidence in your assessment approach.

Your programme leader must have an assessment plan, produced as a spreadsheet. This plan should include:

- the time required to train the assessment team and make sure they are working to the same standards and procedures
- the time available for teaching and carrying out assessments, including when students may complete assessments and when quality assurance will take place

- the completion dates for different assignments
- who is acting as internal verifier for each assignment and the date by which the assignment needs to be verified
- a procedure for internal verifiers to sample assessors' decisions that covers all assignments, assessors and a range of students
- a process to assess and verify students' work so that they receive formal decisions quickly, and
- a system for scheduling resubmissions.

The programme leader must also keep records of all assessments carried out. The key records are:

- checking of assignment briefs
- student declarations
- assessor decisions on assignments, with feedback given to students, and
- confirmation of assessment decisions.

Examples of records and more information are available in the *BTEC Higher Nationals Centre Guide to Quality Assurance and Assessment*, available in the enhanced quality assurance section of our website: https://qualifications.pearson.com/en/qualifications/btec-higher-nationals/about/quality-assurance-process.html.

7.5 Calculating the final qualification grade

7.5.1 Conditions for the award

7.5.1.1 Conditions for awarding our HNC

To achieve our Pearson BTEC Level 4 Higher National Certificate qualification, a student must have:

- completed units equivalent to 120 credits at Level 4, and
- achieved at least a Pass in 105 credits at Level 4.

7.5.1.2 Conditions for awarding our HND

To achieve our Pearson BTEC Level 5 Higher National Diploma qualification, a student must have:

- completed units equivalent to 120 credits at Level 5
- achieved at least a Pass in 105 credits at Level 5
- completed units equivalent to 120 credits at Level 4, and
- achieved at least a Pass in 105 credits at Level 4.

7.5.2 Compensation

7.5.2.1 Compensation for the HNC

Students who have attempted but not achieved a Pass in one of their Level 4 15-credit units can still be awarded an HNC as long as they have completed and passed the remaining units.

7.5.2.2 Compensation for the HND

Students who have attempted but not achieved a Pass in one of their Level 4 15-credit units and one of their Level 5 15-credit units can still be awarded an HND as long as they have completed and passed the remaining units at both levels as per the rules of combination of the required qualification.

7.5.3 Calculating the overall qualification grade

A student's overall qualification grade is based on their performance in all units. They are awarded a Pass, Merit or Distinction using the points gained through all 120 credits at Level 4 for the HNC or Level 5 for the HND. The overall qualification grade is calculated in the same way for the HNC and the HND. For HND, the overall qualification grade is based on student performance in Level 5 units only.

Students must have attempted all units in a valid combination for each qualification. The conditions of award and compensation arrangements will apply as explained above. If a student has been granted compensation for a unit attempted but not achieved, that unit will appear as unclassified (a 'U' grade) on the notification of performance provided with their certificate.

7.5.3.1 Points per credit

Grade	Points
Pass	4
Merit	6
Distinction	8

Table 26: Points per credit by grade

7.5.3.2 Point boundaries

Grade	Point boundaries
Pass	420–599
Merit	600–839
Distinction	840+

Table 27: Point boundaries by grade

7.5.4 Modelled student outcomes

7.5.4.1 Pearson BTEC Level 4 Higher National Certificate

	Credits	Level		Student 1		Student 2		Student 3		Student 4		Student 5	
			Grade point	Grade	Unit points	Grade	Unit points	Grade	Unit points	Grade	Unit points	Grade	Unit points
Core 1	15	4	4	P	60	P	60	P	60	D	120	D	120
Core 2	15	4	4	P	60	P	60	P	60	D	120	M	90
Specialist 3	15	4	4	P	60	P	60	P	60	D	120	M	90
Specialist 4	15	4	4	P	60	P	60	M	90	M	90	M	90
Specialist 5	15	4	6	M	90	P	60	M	90	M	90	M	90
Specialist 6	15	4	6	M	90	P	60	M	90	M	90	M	90
Optional 1	15	4	6	M	90	M	90	D	120	D	120	D	120
Optional 2	15	4	6	M	90	M	90	D	120	D	120	D	120
Total	120	–	–	–	600	–	540	–	690	–	870	–	810
Grade	–	–	–	–	M	–	P	–	M	–	D	–	M

Table 28: Example calculation of HNC qualification grade based on unit grades

Table 28 is provided as a general example of using unit grades to calculate qualification grades. It does not reflect the specifics of this qualification.

7.5.4.2 Pearson BTEC Level 5 Higher National Diploma

	Credits	Level		Student 1		Student 2		Student 3		Student 4		Student 5	
			Grade point	Grade	Unit points	Grade	Unit points	Grade	Unit points	Grade	Unit points	Grade	Unit points
Core 1	15	4	0	P	0	P	0	P	0	D	0	P	0
Core 2	15	4	0	P	0	P	0	P	0	D	0	M	0
Specialist 3	15	4	0	P	0	P	0	P	0	D	0	M	0
Specialist 4	15	4	0	P	0	P	0	M	0	M	0	M	0
Specialist 5	15	4	0	M	0	P	0	M	0	M	0	P	0
Specialist 6	15	4	0	M	0	P	0	M	0	D	0	U	0
Optional 7	15	4	0	M	0	P	0	D	0	D	0	D	0
Optional 8	15	4	0	M	0	P	0	D	0	D	0	D	0
Core 9	15	5	6	M	180	M	180	M	180	P	120	D	240
Specialist 10	15	5	6	M	90	M	90	M	90	P	60	D	120
Specialist 11	15	5	6	M	90	M	90	D	120	P	60	D	120
Specialist 12	15	5	6	M	90	P	60	D	120	P	60	D	120
Optional 13	15	5	6	M	90	P	60	D	120	P	60	M	90
Optional 14	15	5	6	M	90	P	60	M	90	M	90	P	60
Optional 15	15	5	6	M	90	P	60	M	90	M	90	M	90
Optional 16	15	5	6	M	90	P	60	M	90	M	90	M	90
Total	240	–	–	–	810	–	660	–	900	–	600	–	930
Grade	–	–	–	–	M	–	M	–	D	–	P	–	D

Table 29: Example calculation of HND qualification grade based on unit grades

Table 29 is provided as a general example of using unit grades to calculate qualification grades. It does not reflect the specifics of this qualification.

8.0 Quality assurance

The quality assurance system for all Pearson BTEC Higher National programmes is linked to Level 4 and Level 5 of the Quality Assurance Agency (QAA) Framework for Higher Education Qualifications (FHEQ). This means that centres must have effective quality assurance processes to review their programme delivery. It also ensures that assessment grades are in line with national standards.

The quality assurance process for centres offering our Pearson BTEC Higher National programmes has five main features:

1. The approval process.
2. Monitoring internal systems.
3. Independent review of assessments.
4. Annual programme monitoring report.
5. Annual student survey.

8.1 The approval process

If you want to deliver our programmes at your centre, you must apply first through the existing centre approval process and then through the programme approval process. We can consider your application by:

- carrying out a desk-based review, or
- visiting your centre.

You will need to provide evidence that your centre:

- has the human and physical resources needed to deliver and assess the programme effectively
- understands the rules of independent assessment and agrees to follow them
- has a strong internal assessment system supported by 'fit for purpose' assessment documentation, and
- has a system to internally verify assessment decisions so that they are consistent across all assessors and sites.

Your application must be supported by the head of the centre (your principal or chief executive). It must include a declaration that you will operate the programmes strictly and in line with our requirements.

If your centre is already approved and you want to renew approval, you may be able to use our automatic approval process.

We may withdraw qualification or centre approval if we believe you can no longer quality assure your programme delivery or assessment standards.

8.2 Centre and qualification approval

As part of the approval process, your centre must meet the conditions listed below before offering the qualification:

- you must have suitable physical resources (for example equipment, IT, learning materials, teaching rooms) to support delivery and assessment of the qualifications
- you must provide the specific resources required for individual units
- staff involved in the assessment process must have relevant skills or experience
- you must have systems to provide continuing professional development for staff delivering the qualification
- you must have suitable health and safety policies for students and staff using equipment, and
- you must deliver the qualification in line with current equality legislation.

In this way, we can provide qualifications that meet the needs and expectations of students worldwide.

8.3 Monitoring internal systems

You will need to demonstrate that you continue to meet our centre approval criteria over time and across all Higher National programmes. This involves providing evidence to our external examiners for review.

Our examiners will check that:

- your systems and the way you use them remain suitable for supporting the programmes
- you apply student registration and appeals policies consistently, and
- you have effective internal examination and standardisation processes.

In some cases, you may present evidence of your operation within a recognised code of practice, such as that of the Quality Assurance Agency for Higher Education. However, we may still want to confirm independently that these arrangements are operating to our standards.

If our examiners identify problems with your internal systems, we will take steps to help you correct them.

8.4 Independent review of assessments

The external examiner will review your internal assessments for all Pearson BTEC Higher National programmes benchmarked to Levels 4 and 5 of the Quality Assurance Agency (QAA) Framework for Higher Education Qualifications (FHEQ). They will either:

- confirm that your internal assessments meet national standards and allow certification, or
- provide actions to improve the quality of your assessments before allowing certification.

8.5 Annual programme monitoring report (APMR)

This annual review form gives you the opportunity to analyse and reflect on the most recent teaching year. It also provides us with information to help us improve the quality assurance of the Pearson BTEC Higher National programmes. An overview report is produced to outline the findings of the APMR each year.

8.6 Annual student survey

Pearson will conduct an annual survey of Pearson BTEC Higher National students. This provides us with a snapshot of every Higher National student's experience as part of the quality assurance process. Each centre with enough students taking part in the survey will get its own report about their results. You can access the report on HN Global at: http://hnglobal.highernationals.com.

8.7 Continuing quality assurance and standards verification

Each year we update our *BTEC Higher Nationals Centre Guide to Quality Assurance and Assessment*, available in the 'Enhanced quality assurance' section of our website: https://qualifications.pearson.com/en/qualifications/btec-higher-nationals/about/quality-assurance-process.html.
This handbook contains detailed guidance on the quality processes you should follow.

8.7.1 Our key principles of quality assurance

- A centre delivering Pearson BTEC Higher National programmes must be approved by us and must have our approval for the programmes or groups of programmes it is delivering.
- As part of gaining our approval, the centre agrees always to follow our terms and conditions for delivering programmes effectively and assessment quality assurance.

- We provide approved centres with a range of materials and opportunities for reviewing internal materials through our assessment-checking service. This service demonstrates the processes required for effective assessment and provides examples of effective standards. You must use these materials and services to make sure that all staff delivering Pearson BTEC Higher National qualifications keep up to date with the guidance on assessment.
- You must follow agreed processes for:
    - planning, monitoring and recording assessment processes, and dealing with special circumstances, appeals and malpractice, and
    - making sure that assessors and verifiers all work to the same standards.
- We will work in partnership with you to help you achieve quality assured assessment.
- We will help you follow best practice and use suitable technology to support quality assurance processes.
- We will try to make sure our quality assurance processes do not create unnecessary administrative work for you.
- We will monitor and support you in achieving effective assessment and quality assurance.

We will do this by:

- making sure that you complete a suitable declaration at the time of approval
- carrying out approval visits to your centre
- making sure that you have a well-trained, effective team of assessors and verifiers
- sampling and verifying your assessments, assessed student work and other relevant documents, and
- reviewing your strategy for assessing and quality assuring your BTEC programmes.

As an approved centre, you must advertise your certification only with our permission and in line with our reporting requirements.

If you do not have and maintain a strong approach to quality assurance, you will not be able to apply for certification for any Pearson BTEC Higher National qualifications.

If you do not follow our recommendations for improving your quality assurance, we may withdraw approval for you to deliver our qualifications.

9.0 Recognition of Prior Learning and attainment

Recognition of Prior Learning (RPL) is a way of awarding credit if a student can demonstrate they meet the assessment requirements for a unit through knowledge, understanding or skills they already have. As long as the assessment requirements are met, RPL can be used to accredit a unit, units or a whole qualification.

RPL provides a route for recognising the achievements of continuous learning from a range of activities using any valid assessment procedure. We encourage you to recognise students' previous achievements and experiences at work, at home, in leisure and in the classroom. Evidence of learning must be valid and reliable.

For full guidance on RPL, please see *Recognition of prior learning policy and process*, available in the support section of our website: https://qualifications.pearson.com/en/support/support-topics/understanding-our-qualifications/policies-for-centres-learners-and-employees.html.

10.0 Equality, diversity and inclusion

Equality and fairness are central to our work. The design of these qualifications embeds equality, diversity and inclusion as set out in the qualification regulators' general conditions of recognition.

Promoting equality and diversity involves:

- treating everyone with equal dignity and worth, and
- raising ambitions and supporting achievement for people with different needs and backgrounds.

Creating an inclusive learning environment means anticipating students' varying needs and trying to make sure that all students have equal access to educational opportunities. This involves providing access for people who have differing individual needs and removing unnecessary barriers to learning. Qualification design must be inclusive so that students with and without disabilities have equal access to learning opportunities.

Our equity, diversity and inclusion policy requires that:

- all students have an equal opportunity to access our qualifications and assessments
- assessments reflect the wide diversity of students, and
- our qualifications are designed and awarded in a way that is fair to every student.

We are committed to making sure that:

- students with a protected characteristic as defined by law (for example race, sexual orientation, religion or belief) are not disadvantaged in comparison with students who do not share that characteristic
- all students achieve the recognition they deserve for taking a qualification, and
- this achievement can be compared fairly with the achievement of their peers.

Our qualifications should:

- be available to everyone capable of reaching the required standards
- be free from any barriers that restrict access and progress, and
- offer equal opportunities for all those who want to access them.

Please see our *Equity, diversity and inclusion in Pearson qualifications and related services policy*, downloadable from the support section of our website: https://qualifications.pearson.com/en/support/support-topics/understanding-our-qualifications/policies-for-centres-learners-and-employees.html.

Please use your integrity when recruiting students to our Pearson BTEC Higher National programmes. You should:

- make sure they have the information and advice they need about the qualification to be sure that it meets their needs
- check each student's qualifications and experience to make sure they have the potential to achieve the qualification, and
- for students with disabilities and specific needs, consider the support available to them and any other support they may need during teaching and assessment.

Please see our policy documents on students with particular needs.

10.1 Access to qualifications for students with disabilities or specific needs

Students can be assessed in a recognised regional sign language.

Further information on access arrangements can be found on the Joint Council for Qualifications (JCQ) at: https://www.jcq.org.uk/exams-office/access-arrangements-and-special-consideration and *A guide to the special consideration process – General and Vocational Qualifications* downloadable at https://www.jcq.org.uk/exams-office/access-arrangements-and-special-consideration/regulations-and-guidance. Details of how to make adjustments for students with protected characteristics are provided in *Supplementary Guidance for Reasonable Adjustment and Special Consideration in Vocational Internally Assessed Units*. See the support section of our website for both documents: https://qualifications.pearson.com/en/support/support-topics/understanding-our-qualifications/policies-for-centres-learners-and-employees.html.

11.0 Units included in the BTEC Higher Nationals in Engineering

The list of units available for the Pearson BTEC Higher Nationals in Engineering can be found in the document *Unit Descriptors for the Pearson BTEC Higher Nationals Engineering Suite*, available from the Pearson website at https://qualifications.pearson.com/en/qualifications/btec-higher-nationals/engineering-2024-rqf.html.

12.0 Appendices

Appendix 1: Mapping of HND in Engineering against FHEQ Level 5 descriptors

Key for outcome classifications	
KU	Knowledge and understanding
CS	Cognitive skills
AS	Applied skills (referred to as practical skills by QAA)
TS	Transferable skills

Mapping is based on outcome classification descriptors for higher education qualifications at Level 5 on FHEQ.[1]

The HND qualification will be awarded to students who have demonstrated outcomes shown in Table 30.

FHEQ Level 5 descriptor[2]		Engineering HND programme outcomes
Knowledge and critical understanding of the well-established principles of their area(s) of study, and of the way in which those principles have developed	KU1	Knowledge and understanding of the fundamental principles and practices of the contemporary global engineering industry
	KU2	Knowledge and understanding of the external engineering environment and its impact on local, national and global levels of strategy, behaviour, management and sustainability
	KU3	Understanding and insight into different engineering practices, their diverse nature, purposes, structures and operations and their influence on the external environment
	KU4	A critical understanding of the ethical, environmental, legal, regulatory, professional and operational frameworks within which engineering operates

[1] Quality Assurance Agency for Higher Education (2019) *Annex D: Outcome classification descriptions for FHEQ Level 6 and FQHEIS Level 10 degrees*. Available at: https://www.qaa.ac.uk/the-quality-code/qualifications-frameworks.

[2] Quality Assurance Agency for Higher Education (2014) *UK Quality Code for Higher Education – Part A: Setting and Maintaining Academic Standards. The Frameworks for Higher Education Qualifications of UK Degree-Awarding Bodies*. Available at: https://www.qaa.ac.uk/the-quality-code/qualifications-frameworks.

FHEQ Level 5 descriptor[2]		Engineering HND programme outcomes
	KU5	A critical understanding of processes, practices and techniques for effective management of products, processes, services and people
	KU6	A critical understanding of the evolving concepts, theories and models within the study of engineering across the range of operational alternatives
	KU7	An ability to evaluate and analyse a range of concepts, theories, models and techniques to make appropriate engineering operational and management decisions
	KU8	An appreciation of the concepts and principles of continuing professional development (CPD), staff development, team dynamics, leadership and reflective practice as strategies for personal and people development
	KU9	Knowledge and understanding of how the key areas of engineering and the environment it operates within influence the development of people and businesses
	KU10	An understanding of the skills, techniques and methodologies used to resolve problems in the workplace
	KU11	Knowledge and understanding of the human–machine interaction to inform the development of good design and fitness for purpose
Ability to apply underlying concepts and principles outside the context in which they were first studied, including, where appropriate, the application of those principles in an employment context	CS1	Apply knowledge and understanding of essential concepts, principles and models within the contemporary global engineering industry
	AS1	Evidence the ability to show customer-relationship management skills and develop appropriate policies and strategies to meet stakeholder expectations
	AS2	Apply innovative engineering ideas to design and develop new products or services that respond to the changing nature of the engineering industry and the global market
	AS3	Integrate theory and practice through the investigation, evaluation and development of practices and products in the workplace
	AS4	Develop outcomes for customers using appropriate practices and data to make justified recommendations
	CS2	Develop different strategies and methods to show how resources (human, financial, environmental and information) are integrated and effectively managed to successfully meet objectives

FHEQ Level 5 descriptor[2]		Engineering HND programme outcomes
Knowledge of the main methods of enquiry in the subject(s) relevant to the named award, and ability to evaluate critically the appropriateness of different approaches to solving problems in the field of study	CS3	Critically evaluate current principles and operational practices used within the engineering industry as applied to problem-solving
	CS4	Apply project management skills and techniques for reporting, planning, control and problem-solving
	CS5	Recognise and critically evaluate the professional, economic, social, environmental and ethical issues that influence the sustainable exploitation of people, resources and businesses
	CS6	Critique a range of engineering information technology (IT) systems and operations and their application to maximise and successfully meet strategic objectives
An understanding of the limits of their knowledge, and how this influences analysis and interpretations based on that knowledge	TS1	Develop a skill set to enable the evaluation of appropriate actions taken for problem-solving in specific engineering contexts
	TS2	Develop self-reflection, including self-awareness, to become an effective self-managing student, appreciating the value and importance of the self-reflection process
	TS3	Undertake independent learning to expand on own skills and delivered content
Use a range of established techniques to initiate and undertake critical analysis of information, and to propose solutions to problems arising from that analysis	TS4	Competently use digital literacy to access a broad range of research sources, data and information
	CS7	Interpret, analyse and evaluate a range of engineering data, sources and information to inform evidence-based decision-making
	CS8	Synthesise knowledge and critically evaluate strategies and plans to understand the relationship between theory and real-world engineering situations

FHEQ Level 5 descriptor[2]		Engineering HND programme outcomes
Effectively communicate information, arguments and analysis in a variety of forms to specialist and non-specialist audiences, and deploy key techniques of the discipline effectively	TS5	Communicate confidently and effectively, both orally and in writing and both internally and externally, with engineering professionals and other stakeholders
	TS6	Demonstrate strong interpersonal skills, including effective listening and oral communication skills, as well as the associated ability to persuade, present, pitch and negotiate
Undertake further training, develop existing skills and acquire new competences that will enable them to assume significant responsibility within organisations	TS7	Identify personal and professional goals for CPD to enhance competence to practise within a chosen engineering field
	TS8	Take advantage of available pathways for CPD through higher education and professional body qualifications
The qualities and transferable skills necessary for employment requiring the exercise of personal responsibility and decision-making	TS9	Develop a range of skills to ensure effective team working, project and time management, independent initiatives, organisational competence and problem-solving strategies
	TS10	Reflect adaptability and flexibility in approach to engineering, showing resilience under pressure and meeting challenging targets within given deadlines
	TS11	Use quantitative skills to manipulate data and evaluate and verify existing theory
	CS9	Evaluate the changing needs of the engineering industry and have the confidence to self-evaluate and undertake additional CPD as necessary
	TS12	Develop emotional intelligence and sensitivity to diversity in relation to people, cultures and environments

Table 30: Engineering HND outcomes by FHEQ descriptor

Appendix 2: HNC/HND Engineering programme outcomes for students

Indicative mapping is provided for a selection of units in Table 31.

	Knowledge and understanding											Cognitive skills									Applied skills				Transferable skills										
Unit	1	2	3	4	5	6	7	8	9	10	11	1	2	3	4	5	6	7	8	9	1	2	3	4	1	2	3	4	5	6	7	8	9	10	11	12
4001	X			X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X		X	X	X	X
4002	X											X						X					X		X			X							
4003	X											X						X					X		X			X							
4004	X	X	X	X	X	X	X	X	X	X												X	X		X		X				X	X	X	X	X	X
4005	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X	X
4006	X	X	X	X	X	X	X		X			X	X	X	X	X		X	X	X	X	X	X	X	X	X		X	X						X	X
4007	X	X	X								X	X	X					X							X											
4008	X																						X													
4009	X									X								X					X		X			X							
4010	X											X						X					X		X										
4011	X																						X													
4012	X									X													X		X										
4013	X	X	X	X	X	X	X										X	X				X			X						X		X	X	X
4014	X											X						X				X			X		X								
4015	X					X	X											X								X									
4016	X			X	X						X						X	X										X				X			
4017	X																	X								X		X				X			
4018	X	X	X	X	X	X	X		X	X	X						X	X				X		X	X	X		X				X			
4019	X	X	X		X	X	X		X	X															X						X		X		X
4020	X																						X					X				X		X		
4021	X											X										X	X										X			
4022	X																X											X					X		

	Knowledge and understanding											Cognitive skills									Applied skills				Transferable skills										
Unit	1	2	3	4	5	6	7	8	9	10	11	1	2	3	4	5	6	7	8	9	1	2	3	4	1	2	3	4	5	6	7	8	9	10	11	12
4023	X	X	X				X				X		X											X	X			X				X		X		X
4060	X	X	X				X				X		X				X	X						X	X			X				X		X		X
5001	X	X	X	X	X	X	X					X																						X		X
5002	X	X	X	X	X	X	X	X		X	X		X	X	X	X	X	X	X	X	X	X		X	X	X	X		X		X	X	X	X	X	X
5003	X	X	X	X	X	X	X	X		X			X	X	X	X	X		X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X
5004	X						X					X											X										X		X
5005	X	X	X			X	X				X														X			X				X		X		
5006	X											X						X					X		X			X						X		
5007	X											X						X					X		X			X						X		
5008	X																	X										X						X		X
5009	X													X								X	X										X		
5010	X																	X										X						X		
5011	X													X								X	X										X		
5012	X						X											X										X						X		
5013	X					X																						X						X		
5014	X																	X				X	X										X		
5015	X											X																X						X		
5016	X	X	X		X	X	X												X		X	X	X	X							X		X		X
5017	X	X	X	X	X	X	X		X	X	X		X		X				X		X	X	X	X					X	X		X		X		X
5018	X	X	X		X	X	X						X		X	X			X				X											X		X
5019	X	X	X	X	X	X	X	X	X	X			X	X		X	X		X	X	X		X	X	X	X				X			X	X	X	X
5020	X											X						X					X					X						X		
5021	X	X	X		X	X	X																X		X									X		
5022	X			X							X							X					X											X		
5023	X	X	X	X	X	X	X		X	X			X		X			X					X		X	X						X	X	X		
4028			X	X	X		X			X		X			X			X					X				X									
4049					X	X	X			X		X		X				X				X	X	X	X										X	

	Knowledge and understanding											Cognitive skills									Applied skills				Transferable skills											
Unit	1	2	3	4	5	6	7	8	9	10	11	1	2	3	4	5	6	7	8	9	1	2	3	4	1	2	3	4	5	6	7	8	9	10	11	12
4030	X	X	X	X	X	X	X		X		X	X	X	X	X	X	X	X	X			X	X	X	X	X	X	X				X	X	X	X	
4031	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4032	X					X	X											X								X										
4033	X					X	X											X								X										
4034	X	X	X				X				X		X				X	X						X	X			X			X		X		X
4035	X											X						X						X	X											
4036	X									X		X						X					X		X			X								
4037	X		X		X		X					X	X	X	X			X				X	X		X	X			X					X		
4038	X	X	X				X	X	X	X	X	X	X	X	X	X	X	X				X	X		X	X			X	X	X	X	X	X	X	X
4039	X	X	X	X	X	X	X	X	X	X	X	X			X			X		X	X	X	X		X	X	X		X	X		X	X		X	X
4040	X		X	X	X		X	X		X	X		X	X		X	X	X				X	X		X	X	X		X	X	X	X		X	X	
5024	X		X	X	X	X		X	X		X		X	X		X		X			X	X	X		X	X		X	X	X	X		X	X		X
5025	X		X	X		X	X			X	X	X		X	X		X	X		X	X			X	X	X	X		X	X	X		X	X	X	

Table 31: Engineering skills mapping by unit

Appendix 3: HNC/HND Engineering transferable and academic study skills mapping

Transferable skills are based on the three domains of competence (cognitive skills, intrapersonal skills and interpersonal skills) and clusters of competencies published by the National Research Council of the National Academies Committee on Defining Deeper Learning and 21st Century Skills[3] and adapted by Pearson Edexcel.[4]

Indicative mapping for the mandatory core and specialist units is provided in Table 32.

Skill set	**Cognitive skills**							**Intrapersonal skills**				**Interpersonal skills**		
Unit	Problem-solving	Critical thinking/ analysis	Decision-making	Effective communication	Digital literacy	Numeracy	Creativity	Plan/ prioritise	Self-management	Independent learning	Self-reflection	Team work	Leadership	Cultural awareness
4001	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4002	X	X		X	X	X			X	X				
4003	X	X		X	X	X			X	X				
4004	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4005	X	X	X	X	X	X	X	X	X	X	X			X
4006	X	X	X	X	X	X		X	X	X		X		X
4007	X	X	X		X	X	X	X	X	X	X	X		

[3] Committee on Defining Deeper Learning and 21st Century Skills (2012) *Education for Life and Work: Developing Transferable Knowledge and Skills in the 21st Century*. Washington DC: National Research Council of the National Academies.

[4] Pearson Edexcel (2018) *Transferable skills: A guide for schools*. Available at: https://qualifications.pearson.com/en/qualifications/edexcel-international-gcses/the-9-1-grading-scale-explained/transferable-skills.html.

Skill set	Cognitive skills							Intrapersonal skills				Interpersonal skills		
Unit	Problem-solving	Critical thinking/ analysis	Decision-making	Effective communication	Digital literacy	Numeracy	Creativity	Plan/ prioritise	Self-management	Independent learning	Self-reflection	Team work	Leadership	Cultural awareness
4008	X						X	X	X	X	X			
4009	X	X		X	X	X			X	X				
4010	X	X	X		X	X		X	X	X				
4011	X						X	X	X	X	X			
4012	X	X		X	X	X			X	X				
4013	X	X	X	X				X	X	X	X	X	X	X
4014	X	X		X	X	X			X	X				
4015	X						X	X	X	X	X			
4016	X	X	X		X	X		X	X	X	X			
4017	X	X	X		X	X		X	X	X	X			
4018	X	X	X	X	X	X	X	X	X	X	X	X	X	
4019	X	X	X	X	X	X		X	X	X	X	X		
4020	X	X	X		X	X		X	X	X	X			
4021	X	X	X		X	X		X	X	X	X			
4022	X	X	X		X	X		X	X	X	X			
4023	X	X	X	X	X	X	X	X	X	X	X	X		
4024	X	X		X	X	X			X	X				
4025	X	X	X	X	X	X	X	X	X	X	X	X	X	
4026	X	X	X		X	X		X	X	X	X			
4027	X	X	X	X	X	X	X	X	X	X	X	X		
4046	X	X	X		X	X		X	X	X	X	X		
5001	X	X	X	X	X	X	X	X	X	X	X			X
5002	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Skill set	Cognitive skills							Intrapersonal skills				Interpersonal skills		
Unit	Problem-solving	Critical thinking/ analysis	Decision-making	Effective communication	Digital literacy	Numeracy	Creativity	Plan/ prioritise	Self-management	Independent learning	Self-reflection	Team work	Leadership	Cultural awareness
5003	X	X			X	X		X	X	X	X			
5004	X	X			X	X		X	X	X	X			
5005	X	X			X	X		X	X	X	X			
5006	X	X	X	X	X	X		X	X	X	X			
5007	X	X	X	X	X	X	X	X	X	X	X	X		
5008	X	X	X		X	X		X	X	X	X			
5009	X	X	X		X	X		X	X	X	X			
5010	X	X	X		X	X		X	X	X	X			
5011	X	X	X		X	X		X	X	X	X			
5012	X	X	X		X	X		X	X	X	X			
5013	X	X	X		X	X		X	X	X	X			
5014	X	X	X		X	X		X	X	X	X			
5015	X	X	X	X	X	X	X	X	X	X	X	X	X	
5016	X	X	X	X	X	X	X	X	X	X	X	X	X	
5017	X	X	X	X	X	X	X	X	X	X	X	X	X	
5018	X	X	X	X	X	X	X	X	X	X	X	X	X	
5019	X	X	X	X	X	X	X	X	X	X	X	X	X	
5020	X	X	X	X		X	X	X	X	X	X	X	X	
5021	X	X	X		X	X		X	X	X	X			
5022	X	X			X	X		X	X	X	X			
5023	X	X	X		X	X		X	X	X	X	X		
4028	X	X	X			X				X	X			
4029	X	X	X	X		X				X				

Skill set	Cognitive skills							Intrapersonal skills				Interpersonal skills		
Unit	Problem-solving	Critical thinking/ analysis	Decision-making	Effective communication	Digital literacy	Numeracy	Creativity	Plan/ prioritise	Self-management	Independent learning	Self-reflection	Team work	Leadership	Cultural awareness
4030	X	X	X	X	X		X	X	X	X	X	X		X
4031	X	X	X	X			X	X	X	X	X	X	X	X
4032	X	X	X	X	X	X	X	X	X			X		
4033	X	X	X	X	X	X	X	X	X			X		
4034	X	X	X	X	X	X	X	X	X	X	X	X		X
4035	X	X	X			X	X	X	X	X	X	X		
4036	X	X	X	X	X	X		X	X	X	X	X		
4037	X	X	X	X	X	X		X		X		X		
4038	X	X	X		X	X		X		X		X		
4039	X	X	X	X	X	X		X	X		X	X	X	
4040	X	X	X	X	X	X		X		X		X	X	
5024	X	X	X	X	X	X	X	X	X	X		X	X	
5025	X	X	X	X	X	X	X	X	X	X		X	X	

Table 32: Engineering skills mapping by core and specialist units

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