Bradford College

Pearson

Programme Specification
HNC Electrical and Electronic Engineering for England (HTQ)

1	Key Dates	Date of Production:		Latest Revision Date:
		February 2024		N/A
2	School	School of Engineering		
	Department	Construction and Engineering		
3	Awarding Organisation	Pearson		
4	Teaching Institution	Bradford College		
5	Precise title of the final award	Pearson BTEC Level 4 Higher National Certificate in Electrical and Electronic Engineering for England		
6	Programme title	Higher National Certificate in Electrical and Electronic Engineering for England (HTQ)		
7	Details of Accreditation	Pearson/BTEC Higher Technical Qualification (HTQ)/Regulated Qualifications Framework (RQF) - July 2023		
8	FHEQ Level *(does not apply to HNC)*	Level 4		
9	HECoS Code	100163		
10	Mode of Attendance and normal duration of the award *[full-time or part-time] 1 year/2 years*	Full-time: 1 Year Part-time: 1½ Years		
11	Relevant QAA Subject Benchmark Statements	Subject benchmark statements (although not specifically applicable to Higher Nationals) provide a means for the academic community to describe the nature and characteristics of programmes in a specific subject or subject area. They also represent general expectations about standards for the award of qualifications at a given level in terms of the attributes and capabilities that those possessing qualifications should have demonstrated. The programme has been informed by the QAA subject benchmark statement for Engineering.		

		The Quality Assurance system for all Pearson BTEC Higher National programmes is linked to Level 4 and Level 5 of the QAA Framework for Higher Education Qualifications (FHEQ).
12	**Criteria for Admission to the Programme**	A BTEC Level 3 qualification in Engineering *and* a minimum of 80 UCAS points. GCSE Mathematics and English at Grade 4 minimum or equivalent. **Or** A minimum of 80 UCAS points including at least one Level 3 qualification in Maths, Physics or Computer Science. GCSE Mathematics and English at Grade 4 minimum or equivalent. **Or** An Access to Higher Education Certificate in an Engineering discipline awarded by an approved Further Education institution. The School of Engineering welcomes applications from candidates who do not meet the above criteria. Where this is the case applicants will be invited for interview at which they will be expected to provide a portfolio (either physical or digital) that demonstrates professional industry experience in an Engineering discipline and/or demonstrate a strong interest in Engineering through extra-curricular activity, research or work experience. As part of the interview process, candidates will undertake an Engineering aptitude test along with a numeracy and literacy skills assessment. Claims for Recognition of Prior Learning (RPL) and Recognition of Prior Experiential Learning (RPEL) are welcomed by the Programme team.
13	**Educational Aims of the Programme**	

The Level 4 units lay the foundation of learning by providing a broad introduction to the engineering sector as well as a focused introduction to electrical and electronic engineering. This develops and strengthens core skills while preparing students for more 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 scientific and engineering knowledge linked to practical skills obtained through research, independent study, directed study and workplace scenarios. Students are involved in vocational activities that help them to develop behaviours (the attitudes and approaches required for a competence) and transferable skills. Transferable skills are those such as communication, teamwork, research and analysis, which are highly valued in higher education and in the workplace.

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

The objectives of the HNC Electrical and Electronic Engineering for England are as follows:

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

| 14 | **Employability Skills and Competencies** |

The College 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.

The table below shows the type of position in which a student completing the HNC Electrical and Electronic Engineering for England might expect to start and gives some examples of the competencies expected.

Levels of competency	
Employability level at learning level	**Level 4 - Operational**
General employment outcomes	Students successfully completing the HNC Electrical and Electronic Engineering for England can: • perform key electrical and electronic engineering tasks in the sector; • understand processes and operations; and • work effectively.

Examples of roles in different areas of electrical and electronic engineering	- Engineering Technician - Electrical and Electronic Engineering Technician - Engineering Manufacturing Technician - Technician (Electronic) - Technician (Electrical) - Integration and Test Technician - Assistant Project Manager

15	**Key Learning & Teaching Strategy Methods**

The learning and teaching strategy for the HNC Electrical and Electronic Engineering for England (HTQ) is explicitly designed to contribute to the achievement of intended learning outcomes at unit level.

Lectures and Seminars	Along with workshops, these are the most common techniques used by lecturers in the School of Engineering. They offer an opportunity to engage with the full cohort of students, where the focus is on sharing knowledge through the use of presentations. Unit tutors have extensive subject specialist knowledge and experience which is embedded into lectures and seminars to ensure that the students have up-to-date and industry specific knowledge.
Workshops and Labs	These are used to build on knowledge shared via tutors and seminars. They allow the student to experience first-hand the range of specialist software, hardware and equipment used in the engineering industry. Teaching can be more in-depth where knowledge is applied, for example to case studies or real-life examples. Workshops could be student-led, where students present, for example, findings from independent study. Workshops are timetabled for each unit to ensure that students are able to stretch their learning and seek additional support from teaching staff. The balance between lectures, seminars and workshops is dictated by the learning outcomes for each unit.
Tutorials	These provide an opportunity for focused one-to-one support, where teaching is led by an individual student's requirements. These can be most effective in the run up to assessment, where tutors can provide more focused direction, perhaps based on a formative assessment. Students will have a structured tutorial programme and have the option to request additional tutorials, if required. All students will participate in an extensive induction which will commence at the start of the programme and continue throughout their studies. This will include re-visiting and developing academic skills including

		academic writing, research and referencing, alongside developing key soft skills.
	Virtual Learning Environments (VLEs) - Moodle/ MS Teams	These are invaluable to students studying on a face-to-face programme. Used effectively, VLEs not only provide a repository for taught material such as presentation slides or handouts, but could be used to set formative tasks such as quizzes. Further reading is located on the VLE, along with a copy of the programme documents, such as the handbook and assessment timetable. The subject specialist librarian regularly accesses and updates programme and Moodle pages to ensure that the most relevant and up-to-date journals and e-books are linked and students have access to them. Tutors provide a wide range of resources on Moodle including further reading, videos, flipped learning tasks and links to essential sources.
	Work Based Learning	The School of Engineering works closely with a number of industry partners to ensure that academic content is closely linked to the world of work. This adds realism and provides students with an opportunity to link theory to practice. Many of the students are already employed in the engineering industry and this provides an opportunity to share industry practice with those students progressing from Level 3. As far as possible, each student will undertake a 'live' project as part of the programme. The specification for this will be agreed with an industry partner or employer who may also provide mentoring, site visits, support and advice during the development stage. The School of Engineering records student presentations of their project work and these are made available to Level 4 students, employers, stakeholders and external examiners. This provides valuable feedback for students as well as providing a further opportunity to engage with the wider engineering community. Although work placements are not mandatory on the programme, students who are not work based will be encouraged to undertake industry work placements throughout their programme to enrich the skills and knowledge gained and to develop contacts in the engineering industry.
	Guest Speakers	The School of Engineering invites guest speakers from time to time to provide an insight into practical, work-based activities and to deliver masterclasses. The objective is to make the most effective use of an expert's knowledge and skills by adding value to the teaching and learning experience.
	Field Trips	Effectively planned field trips, which have a direct relevance to the syllabus, add value to the learning experience. The School of Engineering plans a range of visits to conferences, seminars and events during the academic year. These include visits to:

		▪ Don Whitley Scientific
		▪ Drax Power Station
		Through these trips, students relate theory to practice, have an opportunity to experience organisations in action and, potentially, open their minds to career routes.

The programme will produce students who possess a rounded knowledge and understanding of Electrical and Electronic Engineering principles and have the skills to analyse complex problems appropriate to Engineering. The learning and teaching strategy is designed to supplement the students' existing knowledge and to encourage their acquisition of new subject knowledge while supporting them in the move towards a greater degree of independence and self-direction.

All students have access to College library/learning centre resources including Maths and English Language workshops.

Through lectures, students are encouraged to develop the understanding of the concepts, theories and principles prior to application. Students will develop skills in listening and selective note taking and appreciate how information is structured and presented.

16	**Key Assessment Strategy/Methods**

The programme assessment strategy was developed with reference to the College Learning, Teaching and Assessment Strategy. The assessment process for the HNC Electrical and Electronic Engineering for England programme reflects both the aims and learning objectives of the programme and establishes clear links with the underlying philosophy of the learning and teaching strategy. This requires the use of a wide range of assessment methods involving an appropriate balance between formative and summative methods.

Formative assessment is primarily developmental in nature and designed to give feedback to students on their performance and progress. Assessment designed formatively should develop and consolidate knowledge, understanding, skills and competencies. It is a key part of the learning process and can enhance learning and contribute to raising standards. Through formative assessment tutors can identify students' differing learning needs early on in the programme and so make timely corrective interventions. Tutors can also reflect on the results of formative assessment to measure how effective the planned teaching and learning is at delivering the syllabus. Each student should receive one set of written formative feedback. This type of formative assessment encourages reflective practice, develops academic and personal skills and builds student confidence. Formative assessment is in evidence in all units throughout the programme.

Summative assessment is where students are provided with the assignment grades contributing towards the overall unit grade. For summative assessment to be effective it should also give students additional formative feedback to support ongoing development and improvement in subsequent assignments. All formative assessment feeds directly into

the summative assessment for each unit and lays the foundations from which students develop the necessary knowledge and skills required for the summative assessment.

Each unit has a set of assessment criteria which the student must demonstrate to achieve a pass grade. Students will undertake one or more pieces of assessment for each unit and will need to show the assessment criteria for the unit have been met. Some of the assessments have elements of negotiation where the student can make decisions and agree with the tutor what will be undertaken for assessment. This ensures that the work has personal and professional relevance.

Underpinning assessment are the following principles:

- Assessment is valid - in that it tests an appropriate skill or ability;
- Assessment is reliable - in that the same result would be achieved if repeated;
- Assessment is relevant - in that it is set in the context of the practices and needs of industry;
- Assessment forms part of a student's learning - in that assessment is not seen as simply a measurement tool but as a key part of the learning process and, through formative feedback, a means of supporting progression.

For each year of study the programme team will monitor summative assessment requirements across units in order to ensure, where possible, smooth student workload.

Assessments may include elements of:

- practical assessments
- portfolios of evidence
- 'in class' tests
- lab work
- case studies
- reflective activities where you look back over your experiences, analyse them with the assistance of relevant theory and reflective tools, and learn from the experience;
- online discussions that you have had with your peers, tutors and invited contributors to the programme;
- oral and written reports;
- journals, blogs and log books;
- plans (e.g., action plans, plans for your group activities);
- presentations

All written work related to assessments will be submitted via Turnitin to ensure authentication of students' work.

| 17 | **Programme Units** | | | | | |

Stage 1 (total 120 credits)

Unit number	Pearson Code	Title	Credits	Level	Mandatory Core or Mandatory Specialist Unit
4001	K/615/1475	Engineering Design	15	4	Mandatory Core
4002	M/615/1476	Engineering Maths	15	4	Mandatory Core
4004	F/615/1478	Managing a Professional Engineering Project (Pearson-set unit)	15	4	Mandatory Core
4014	H/615/1488	Production Engineering for Manufacture	15	4	Mandatory Specialist
4015	K/615/1489	Automation, Robotics and Programmable Logic Controllers (PLCs)	15	4	Mandatory Specialist
4017	H/615/1491	Quality and Process Improvement	15	4	Mandatory Specialist
4019	M/615/1493	Electrical and Electronic Principles	15	4	Mandatory Specialist
4021	A/615/1495	Electrical Machines	15	4	Mandatory Specialist

18	**Programme Structure**

The part-time HNC Electrical and Electronic Engineering for England (HTQ) structure is a blend of semesterised and year-long units. In the first year of the programme, students will take 5 units taught over 30 weeks. In the second year of the programme, students will take the remaining 3 units semesterised over 15 weeks in semester 1. This structure meets the needs of local industry as the first stage of offering a 3 year, part-time HND qualification.

The full-time HNC Electrical and Electronic Engineering for England (HTQ) structure will deliver 8 units, 5 of which will be year-long over 30 weeks and the remaining 3 units delivered semesterised in semester 1. Delivery will take place over two full-days in semester 1 and one full-day in semester 2.

The units are sequenced to provide students with a coherent learning experience which will satisfy the programme aims and unit outcomes and enhance student retention. The structure will also ensure a practicable, even spread of student assessments throughout the academic year.

The units on this programme have been designed from a learning time perspective. For example, a 15 credit point unit is equivalent to approximately 150 learning hours, of which 60 hours will be guided learning hours (i.e. when your tutor is present in a lecture or workshop).

The HNC programme has a total value of 120 credits and is equivalent to approximately 1200 hours total learning time (TLT). Within this learning time - which is time taken by students to complete the learning outcomes of each unit determined by the assessment criteria - there are Guided Learning Hours (GLHs). These are defined as time when your tutor is present and giving specific guidance towards the learning aim being studied (e.g. lectures, tutorials, workshops). On this programme, there are 480 GLHs.

HNC Electrical and Electronic Engineering for England (HTQ) - Part-Time

Part-Time - Year 1	
Semester 1	**Semester 2**
Unit 4001: Engineering Design	
Unit 4002: Engineering Maths	
Unit 4004: Managing a Professional Engineering Project	
Unit 4014: Production Engineering for Manufacture	
Unit 4015: Automation, Robotics and Programmable Logic Controllers (PLCs)	

Part-Time - Year 2	
Semester 1	**Semester 2**

	Unit 4017: Quality and Process Improvement	
	Unit 4019: Electrical and Electronic Principles	
	Unit 4021: Electrical Machines	

HNC Electrical and Electronic Engineering for England (HTQ) - Full-Time

Full-Time - Year 1	
Semester 1	**Semester 2**
Unit 4001: Engineering Design	
Unit 4002: Engineering Maths	
Unit 4004: Managing a Professional Engineering Project	
Unit 4014: Production Engineering for Manufacture	
Unit 4015: Automation, Robotics and Programmable Logic Controllers (PLCs)	
Unit 4017: Quality and Process Improvement	
Unit 4019: Electrical and Electronic Principles	
Unit 4021: Electrical Machines	

| 19 | **Support for Students and Their Learning**

Student progression on the programme is supported by subject tutors and central College services.

<u>College</u>

The College employs dedicated staff to offer specialist advice and assistance for all students:

Bradford Student Health Service is a dedicated NHS GP service specialising in Student Health. The Student Health Service provides a confidential and comprehensive service of health care with access to specialist services. Students who live in the practice area can register with one of the doctors and make full use of the service.

The Additional Learning Support team looks after the learning support needs of all students with disabilities or difficulties in College, irrespective of their programme of study. They |

provide support and guidance for students whilst developing close links with programme tutors to ensure that the support put in place is appropriate to the students' individual needs and the requirements of the programme.

Library resources are available on the ground floor of Trinity Green and the David Hockney Building with library staff available to give assistance if required.

Technology and Media Services are located on the second floor of the David Hockney Building. Various pieces of IT equipment can be accessed to enhance the learning experience.

There are also other areas of personal interest to students, for example, the gym in the Trinity Green Building.

Programme

- The programme is managed by a Programme Leader who will aim to ensure that students meets the learning outcomes alongside the awarding body expectations for quality.
- Teaching is delivered by an experienced team of lecturers each of whom has expertise in a range of specialist subjects.
- Induction week comprises of a full programme of events designed to welcome students to the College, and make them familiar with their new surroundings. The process of establishing effective relationships between students and the teaching team begins at this point and activities are geared towards establishing and promoting a cohort identity. All students are provided with a Student and Programme Handbook and supported in gaining access to on-line resources.
- Extensive use is made of a VLE. This has comprehensive support materials at programme and unit level as well as additional learning resources and links to off-site study support. Independent learning is encouraged through the use of student forums, blogs and message boards. These are also used to provide students with regular and timely formative feedback.
- At the start of each academic year all students undertake a numeracy and literacy skills test. The results of these are analysed and allow for student specific additional support to be offered where required.
- Throughout the academic year all students have timetabled study skills sessions. These sessions support students with the transition to Level 4 and Level 5 study, prepare them for progression to Level 6 and enable them to align practical skills with the academic rigour associated with Higher Education.
- The School of Engineering is equipped with hardware, software and equipment that reflects the standards required by industry. Specialist software is provided. Hardware, software and equipment requirements are reviewed annually.
- A tutorial system is in place that provides academic and pastoral support to all students. Staff are available on both a walk-in and by-appointment basis. Staff are also contactable via e-mail, Microsoft Teams and the VLE.
- A Personal Tutor is assigned to each student to provide pastoral care and an opportunity to discuss any issues that may arise throughout the academic year.
- The College has extensive library facilities including a wide range of on-line resources. Library resources are reviewed by the programme team on an annual basis. Group study areas are available within the College library.

	The Teaching Team operates a series of additional workshops throughout the academic year. A specialist tutor is available at each of these to offer support and guidance to students.
20	**Distinctive Features** The HNC/D Electrical and Electronic Engineering for England (HTQ) are work-related qualifications for students taking their first steps into employment, or for those already in employment and seeking career development opportunities. The programmes provide progression into the workplace either directly or via study at Level 5 and 6 and are also designed to meet employer's needs. Pearson BTEC Higher National qualifications are widely recognised by industry as the principal vocational qualification at Levels 4 and 5. When redeveloping the programme, Pearson collaborated with a wide range of students, employers, higher education providers, colleges and subject experts to ensure that the new qualifications meet their needs and expectations. They also worked closely with the relevant professional bodies to ensure alignment with recognised professional standards. There is now a greater emphasis on employer engagement and work readiness. The new Pearson BTEC Higher National qualifications in Engineering (HTQs) are designed to reflect this increasing need for high quality professional and technical education programmes at Levels 4 and 5, thereby providing students with a clear line of sight to employment and to progression to a degree at Level 6. The School of Engineering has established close links with both local business and the local community. Wherever practicable, assessment on the programme reinforces these links.
21	**Regulation of Assessment** Assessment regulations are as published by the College and are in accordance with guidance provided by Pearson/BTEC. Regulations relevant to this programme of study are published in the programme handbook.
22	**Indicators of Quality and Standards** Annual review and monitoring will be conducted in line with College processes. The full cycle of review will take place and is identified in the HE Quality calendar. This cycle includes unit review/evaluation by students and staff and Student Experience Surveys (SES). Measures are in place to ensure robust internal and external quality assurance. These quality-related processes are outlined below: Programme committee meetings and annual monitoring events which are attended by student representatives. Unit reviews which are completed by students/staff.

	Moodle will also host chatrooms and forums so that students can liaise regularly with one another as well as tutors.

The delivery of the HNC Electrical and Electronic Engineering for England (HTQ) will be reviewed annually via production of an Annual Monitoring Report and, on a much more regular basis, through meetings of the programme delivery team.

The programme will also be subject to external quality assurance processes such as external examiner review. |
| 23 | **The Role of the Awarding Body**

As the awarding body, Pearson provides a programme of BTEC Higher Nationals offering specialist vocational study at Levels 4 and 5 which reflects the requirement of professional organisations and meets the National Occupational Standards for each sector or industry.

BTEC Higher Nationals in Engineering for England are directly available from Pearson as RQF/HTQ qualifications. To offer BTEC Higher Nationals, colleges must have both Centre and Qualification Approval.

Pearson operates a quality assurance system for all BTEC Higher National programmes which ensures that centres have effective quality assurance processes to review programme delivery and that the outcomes of assessment are to national standards. |
| 24 | **External Examination**

Pearson/BTEC assures itself of the standard of provision offered at the College through a series of quality assurance activities, including external examining.

An independent academic, appointed by Pearson/BTEC, visits the College and assures themselves and Pearson/BTEC (via an annual report) of the quality of facilities, academic delivery and student achievement against described standards. |