Pearson BTEC Level 5 HND Diploma in Electrical and Electronic Engineering (QCF)

Code: BTECEE5 Guided Learning Hours: 960 Hours

Programme Structure:

The Pearson BTEC Level 5 HND Diploma in Electrical and Electronic Engineering (QCF) is a qualification with a minimum of 240 credits of which 65 credits (earned from Unit 1 to Unit 4) are mandatory. It must contain a minimum of 125 credits at Level 5.

ELITC offers the following units of study for earning a BTEC Level 5 HND Diploma in Electrical and Electronic Engineering (QCF).

Unit No.	Unit Descriptions	Unit Level	Unit Credit
1	Analytical Methods for Engineers*	4	15
2	Engineering Science*	4	15
3	Project Design, Implementation and Evaluation*	5	20
4	Electrical and Electronic Principles*	5	15
5	Business Improvement Techniques	5	15
6	Programmable Logic Controllers	4	15
7	Further Analytical Methods for Engineers	5	15
8	Statistical Process Control	5	15
9	Management of Projects	4	15
10	Electronic Principles	5	15
11	Advanced Mathematics for Engineering	5	15
12	Combinational and Sequential Logic	4	15
13	Managing the Work of Individuals and Teams	5	15
14	Computer Programming Techniques	4	15
15	Digital and Analogue Devices and Circuits	5	15
16	Telecommunication Principles	5	15
		Total:	**245**

* *Mandatory Core Units*

Unit Synopsis *(* Unit 1 to Unit 4: Mandatory Core Units)*

Unit 1: Analytical Methods for Engineers*

Objectives

Provide the analytical knowledge and techniques needed to carry out a range of engineering tasks and provide a base for further study of engineering mathematics.

Learning outcomes

Upon completion of this unit, student will be able to analyse and model engineering situations and solve problems using:

- Algebraic methods
- Trigonometric methods
- Calculus
- Statistics and Probability.

Unit 2: Engineering Science*

Objectives

Provide students with an understanding of the mechanical and electrical principles that underpin mechanical and electrically focused engineering systems.

Learning outcomes

Upon completion of this unit, student will be able to:

- Determine the behavioural characteristics of elements of static engineering systems
- Determine the behavioural characteristics of elements of dynamic engineering systems
- Apply DC theory to solve electrical and electronic engineering problems
- Apply single-phase AC theory to solve electrical and electronic engineering problems.

Unit 3: Project Design, Implementation and Evaluation*

Objectives

Develop students' skills of independent enquiry by undertaking a sustained investigation of direct relevance to their vocational, academic and professional development.

Learning outcomes

Upon completion of this unit, student will be able to:

- Formulate a project
- Implement the project within agreed procedures and to specification
- Evaluate the project outcomes
- Present the project outcomes.

Unit 4: Electrical and Electronic Principles*

Objectives

Provides an understanding of electrical and electronic principles used in a range of engineering careers and provides the basis for further study of more specialist areas of electrical/electronic engineering.

Learning outcomes

Upon completion of this unit, student will be able to:

- Apply electrical and electronic circuit theory
- Apply two-port network models
- Understand the use of complex waves
- Apply transients in R-L-C circuits.

Unit 5: Business Improvement Techniques

Objectives

Provide students with knowledge of some of the business improvement methodologies and techniques that can be applied in a variety of manufacturing situations.

Learning outcomes

Upon completion of this unit, student will be able to:

- Apply the principles of lead-time analysis by creating a lead-time profile, frequency diagram and by using a cause and effect diagram
- Use techniques in set-up reduction and prepare an improved standard operating procedure
- Understand the benefits of total productive maintenance (TPM) techniques
- Understand optimised production technology (OPT).

Unit 6: Programmable Logic Controllers

Objectives

Investigate programmable logic controller (PLC) concepts and their applications in engineering.

Learning outcomes

Upon completion of this unit, student will be able to:

- Understand the design and operational characteristics of a PLC system
- Understand PLC information and communication techniques
- Apply programmable logic programming techniques
- Understand alternative implementations of programmable control.

Unit 7: Further Analytical Methods for Engineers

Objectives

Develop the analytical knowledge and techniques necessary to analyse and solve a variety of engineering situations and problems.

Learning outcomes

Upon completion of this unit, student will be able to analyse and model engineering situations and solve problems using:

- Number Systems
- Graphical and Numerical Methods
- Vector Geometry and Matrix Methods
- Ordinary Differential Equations.

Unit 8: Statistical Process Control

Objectives

Apply relevant statistical techniques used in process quality control and to evaluate a process against a given specification.

Learning outcomes

Upon completion of this unit, student will be able to:

- Understand the basic types, variations and characteristics of statistical techniques used in process control
- Select data, construct process control charts and initiate a control program for a specified application
- Evaluate process capability against a given product or component quality requirement using modified control chart limits
- Analyse types of variation within a process and record information on that variation.

Unit 9: Management of Projects

Objectives

Provides an understanding and experience of project management principles, methodologies, tools and techniques that may be used in industry and the public sector.

Learning outcomes

Upon completion of this unit, student will be able to:

- Understand the principles of project management
- Plan a project in terms of organisation and people
- Manage project processes and procedures.

Unit 10: Electronic Principles

Objectives

Develop students' understanding of analogue electronics and their applications across the engineering sector.

Learning outcomes

Upon completion of this unit, student will be able to:

- Apply testing procedures for semiconductor devices and circuits
- Understand the characteristics and operation of amplifier circuits
- Understand the types and effects of feedback on circuit performance
- Understand the operation and applications of sine wave oscillators.

Unit 11: Advanced Mathematics for Engineering

Objectives

Provide the analytical knowledge necessary for studying engineering to degree level and will provide the more advanced knowledge required for a range of careers in engineering.

Learning outcomes

Upon completion of this unit, student will be able to analyse and model engineering situations and solve engineering problems using:

- Series and numerical methods for the solution of ordinary differential equations
- Laplace transforms
- Fourier series
- Partial Differential Equations.

Unit 12: Combinational and Sequential Logic

Objectives

Provide students with the skills and understanding required to design and build electronic circuits that use combinational and sequential logic.

Learning outcomes

Upon completion of this unit, student will be able to:

- Design and build circuits using combinational logic
- Design and build circuits using sequential logic
- Design and evaluate a digital system.

Unit 13: Managing the Work of Individuals and Teams

Objectives

Develops students' understanding and skills associated with managing the work of individuals and teams. It enhances the ability to motivate individuals and to maximise the contribution of teams to achieve outcomes.

Learning outcomes

Upon completion of this unit, student will be able to:

- Establish the objectives of individuals
- Evaluate the performance of individuals
- Establish the roles and responsibilities of teams
- Review the performance of teams.

Unit 14: Computer Programming Techniques

Objectives

Develop students' understanding of computer programming techniques and will enable them to design and develop programs for a variety of applications.

Learning outcomes

Upon completion of this unit, student will be able to:

- Design and develop code using structured programming methods
- Use modularisation appropriate to the chosen programming language
- Produce appropriate documentation for a given program application
- Create and apply appropriate test schedules.

Unit 15: Digital and Analogue Devices and Circuits

Objectives

Develop the knowledge and skills needed to design and test DC power supply systems, operational amplifier circuits and digital electronic circuits.

Learning outcomes

Upon completion of this unit, student will be able to:

- Design, test and evaluate electronic DC power supply systems
- Design and test operational amplifier circuits
- Design, construct and test digital electronic circuits.

Unit 16: Telecommunication Principles

Objectives

Develop students' understanding of the principles and characteristics of telecommunication systems.

Learning outcomes

Upon completion of this unit, student will understand:

- The requirements of communication systems
- Communication channels and their characteristics
- Modulation and multiplexing techniques used for analogue and digital signals
- The characteristics of communications traffic.

Entry Requirements:

- Applicants who are at least 18 years of age to satisfy at least one of the following requirments:
  - GCE 'A' Level passes in Mathematics or Science subject or equivalent; or
  - Pearson BTEC Level 3 / WSQ-Advanced Certificate qualification in Engineering or equivalent; or
  - Higher *Nitec* / ITC qualification in Engineering or equivalent; or
  - *Nitec* in Engineering or equivalent may apply for admission under Recognition of Prior Learning (RPL). Shortlisted applicants need to complete a bridging programme conducted by ELITC.
- Mature applicants (at least 21 years of age) with minimum 2 years of relevant working experience but do not possess the required qualifications will be considered on a case by case basis
- International applicants must have English Proficiency with:
  - IELTS (International English Language Testing System) score of at least 5.50; or
  - A level of competence equivalent to a TOEFL (Test of English as a Foreign Language) score of 500 or equivalent
- Applicants should be free from colour appreciation deficiency.

Duration:

The total minimum required Guided Learning Hours (GLH) for 16 Units is 960 hrs. This programme is offered either as:

- **Full-time** over 18 months which comprises a total of 6 trimesters. All classes will be conducted from 9.00 am to 5.30 pm on weekdays. Full-time students will have an average of 25 GLH per week.
- **Part-time** over 24 months which comprises a total of 8 trimesters. All classes will be conducted 2 sessions per week from 9.00 am to 4.00 pm or 2 evening sessions during weekdays from 6.30 pm to 9.30 pm and 1 weekend session from 9.00 am to 4.00 pm. Part-time students will have an average of 12 GLH per week.

Training Medium:

This programme is conducted in English.

Training Methodology:

This programme is delivered through lectures, E-learning, tutorials, lab, hands-on activities, role-plays, case studies, work assignments, group discussions and discussion forums.

Essential Requirements:

- Scientific Calculator: CASIO FX-570MS / CASIO FX-991MS / SHARP EL-506W / SHARP EL-520W
- Personal Laptop

Assessment:

Assessments will be conducted through the two components as follows:

- Continuous Assessment Component. This is to assess the student on a continuous basis throughout the entire trimester. This assessment strategy includes quiz, lab assessment, group project, individual work assignment with presentation, group-based assignment with presentations and other forms of assessment.
- Final Assessment Component. This is normally held at the end of a trimester. Most of the units require the students to undertake practical assessment and /or written assessment.

Grading System:

Each successfully completed unit will be graded a **Pass, Merit or Distinction**.

Unit Grade	Generic Grade Descriptors
Pass	• All learning outcomes and associated assessment criteria have been met
Merit	• Pass requirements achieved • All Merit grade descriptors achieved
Distinction	• Pass and Merit requirements achieved • All Distinction grade descriptors achieved

Certification:

Student must achieve a minimum of 240 credits (of which at least 125 must be at Level 5) and pass all the 16 Units to be awarded with Pearson BTEC Level 5 HND Diploma in Electrical and Electronic Engineering (QCF) certificate within 3 years from the registration date.

Student must satisfy the minimum attendance requirements in all the units for the award of Statement of Attendance. Full-time Students, both local and international, must attain a minimum of 90% of scheduled unit hours or not be absent from the unit for consecutive 7 days. As for Part-time Students, the minimum attendance requirement is 80%.

Progression Pathway:

As this programme earns global recognition, students who have qualified up to Pearson BTEC Level 5 HND Diploma in Electrical and Electronic Engineering (QCF) would have earned enough credits for direct entry to recognised universities in UK, USA and Australia.

For more information, please visit the degree course finder from Pearson website: https://degreecoursefinder.pearson.com.

Career Prospects:

This programme helps students to gain employment opportunities in the manufacturing as well as the electrical or electronic engineering sector where students may move towards supervisory or managerial positions. This programme also serves as a good training route for students to switch into electrical or electronic engineering sector.