

Access to Higher Education Unit

This unit forms part of an Access to HE Diploma. If delivering the graded version of this unit, please refer to the Provider Handbook for details on grading descriptors and the application of these across units within your programme.

Unit Title: Circuit Networks and Power Distribution

Graded Unit Reference Number: GA33EEE05

Ungraded Unit Reference Number: UA33EEE05

Module: Electrical and Electronic Engineering

Level: Three (3)

Credit Value: Three (3)

Minimum Guided Learning Hours: 30

Learning Outcome (The Learner will):	Assessment Criterion (The Learner can):
1. Understand the use of circuit theorems in the solution of A.C. and D.C. circuit problems	1.1 Use the Principle of Superposition to solve circuit problems
	1.2 Explain the ideal concepts of constant current and constant voltage sources
	1.3 Deduce constant current and constant voltage equivalent circuits for practical sources and convert from one type of equivalent circuit to the other
	1.4 Use Thevenin's and Norton's theorems to solve problems
	1.5 Solve problems for resistive loads using the maximum power transfer theorem
	1.6 Derive the turn's relationship for transformer matching and apply it to problems
2. Understand the basic theory of balanced three-phase circuits	2.1 With reference to the UK National Grid, describe the three-phase electricity supply network and explain the reasons for its use
	2.2 Describe star and delta (3 wire and 4 wire) methods of connection and explain their use for power distribution

2.3 Solve problems using the relationship between line and phase quantities under balanced conditions

2.4 Show that power dissipation in a three-phase load is the sum of single-phase powers

2.5 Show that the power in a balanced three phase load is $\sqrt{3} \cdot V_{line} I_{line} \cos \phi$