

Certificate in Electrical Power Engineering at SCQF Level 5 (2305-51)

March 2021 Version 1.0

Qualification Handbook

Qualification at a glance

Subject area	Electrical Power Engineering
City & Guilds number	2305
Age group approved	16+
Entry requirements	None
Assessment	Portfolio of evidence
Approvals	Auto
Support materials	Centre handbook Unit pack
Registration and certification	Consult the Walled Garden/Online Catalogue for last dates

Title and level	City & Guilds number	Accreditation number
Certificate in Electrical Power Engineering at SCQF Level 5	2305-51	R660 04

Version and date	Change detail	Section
1.0 Feb 2021	First published	

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1 Introduction

This document tells you what you need to do to deliver the qualifications:

Area	Description
Who is the qualification for?	This qualification is for those in the power industry. They will be undertaking a Modern Apprenticeship in Power Distribution SCQF Level 5, wishing to prove competence or progress to a more advanced role.
What do the qualification cover?	These qualifications allow candidates to learn, develop and practise the skills required for employment and/or career progression in the power industry.
What opportunities for progression are there?	They allow candidates to progress into employment.
Who did we develop the qualification with?	Power sector employers and the Sector Skills Council Energy & Utility Skills (EU Skills).
Is it part of an apprenticeship framework or initiative?	This qualification supports the Power Industry Distribution and Transmission apprenticeships at Level 5.

Structure

To achieve the Certificate in Electrical Power Engineering at SCQF Level 5 learners must complete a total of 9 units.

All mandatory units 501 - 503

Plus

4 units from Group E, units 525 -548

Either

Minimum of 2 units from Optional Group B – Overhead Lines, units 504 – 512

Or

Minimum of 2 units from Optional Group C - Substation Plant, units 513 – 519

Or

Minimum of 2 units from Optional Group D – Underground Cables, units 520 -524

	City & Guilds unit number	Unit title	SCQF Credit Value
Group A - Mandatory			
	501	Working safely in the power sector	4
	502	Working efficiently and effectively in the power sector	2
	503	Using and communicating technical information in the power sector	3
Optional Group B – Overhead Lines			
	504	Install overhead steelwork, fittings and conductors on wood pole structures	15
	505	Dismantle overhead steelwork, fittings and conductors on wood pole structures	15
	506	Install and configure distribution apparatus on wood pole structures	15
	507	Fault repair of overhead line distribution assets	20
	508	Live low voltage distribution work	12
	509	Install and replace fittings on steel tower structures	15
	510	Install Extra High Voltage conductors on steel tower structures	15
	511	Dismantle Extra High Voltage conductors on steel tower structures	15
	512	Maintain apparatus on steel tower structures	15
Optional Group C – Substation Plant			
	513	Install distribution substation plant and apparatus	15
	514	Dismantle distribution substation plant and apparatus	15
	515	Maintain distribution substation plant and apparatus	15

	516	Install primary and Extra High Voltage substation plant and apparatus	15
	517	Dismantle primary and Extra High Voltage substation plant and apparatus	15
	518	Maintain primary and Extra High Voltage substation plant and apparatus	15
	519	Fault repair of distribution and high voltage substation plant and apparatus	20
Optional Group D – Underground Cables			
	520	Service jointing on low voltage underground cables	12
	521	Jointing and termination of low voltage mains underground cables	15
	522	Jointing and termination of high voltage (up to 25 kV) underground cables	15
	523	Repairs to faulted or damaged Low Voltage service and mains cables (non-diagnosis)	20
	524	Repairs to faulted or damaged High Voltage cables (non-diagnosis)	20
Optional Group E			
	525	Movement of cable, plant and apparatus	6
	526	Access, egress and movement in substations	4
	527	Electrical and functional testing of fitting plant and apparatus	6
	528	Inspection and maintenance of battery systems	8
	529	Substation earthing installation and testing	8
	530	Inspection of substation plant and apparatus	6
	531	Maintain compressed air systems	6
	532	Location and identification of underground utility services	4
	533	Access and egress and movement within the working area	2

	534	Electrical testing of underground cables and apparatus	6
	535	Carry out excavation activities on underground cables	4
	536	Inspect the installation of underground cables	4
	537	Install underground cables	4
	538	Carry out jointing on pilot/telephone cables	8
	539	Carry out jointing on low voltage concentric cables	8
	540	Carry out jointing on low voltage consac cables	8
	541	Movement of overhead line plant and apparatus	10
	542	Access and egress and work on wood pole structures	8
	543	Access and egress and work on steel tower structures	8
	544	Excavate and install distribution wood poles and stays	6
	545	Electrical testing of overhead line distribution equipment	6
	546	Inspection of overhead line wood pole networks	4
	547	Earthing of overhead line conductors on steel tower structures	6
	548	Jointing of overhead line Extra High Voltage conductors	6

2 Centre requirements

Approval

All centres previously approved to offer the 2343-51, 52 & 53 Certificates in Electrical Power Engineering at SCQF Level 5 qualification will be given automatic approval to offer 2305-51 Certificate in Electrical Power Engineering at SCQF Level 5.

Automatic approval is available for 12 months from the launch of the qualification. After this time, the qualification is subject to the standard Qualification Approval Process. It is the centre's responsibility to check that automatic approval is still current at the time of application.

Centres not previously offering the 2343-51, 52 & 53 qualifications will need to apply for qualification approval through the standard approval process.

Centres will need to gain both centre and qualification approval. Please refer to the City & Guilds Centre Manual for further information.

Centre staff should familiarise themselves with the structure, content and assessment requirements of the qualifications before designing a course programme.

Resource requirements

Centre staffing

City & Guilds quality assurance includes initial centre approval, scheme approval, the centre's own procedures for monitoring quality and City & Guilds' ongoing monitoring by an External Verifier.

- City & Guilds External Verifiers will:
 - ensure that internal verifiers are undertaking their duties satisfactorily
 - monitor internal quality assurance systems and sampling assessment activities, methods and records
 - act as a source of advice and support
 - promote best practice
 - provide prompt, accurate and constructive feedback to all relevant parties on the operation of centres' assessment systems.

In line with the Sector Skills Council Energy & Utility Skills' assessment strategy, all assessors, internal verifiers and external verifiers involved in the delivery of power sector qualifications (within which the renewables sector falls) must:

Assessors:

- must hold, or be working towards, valid assessor qualifications as defined by the Qualification Regulator
- must be occupationally competent in the units they are assessing. Centres must evidence that the assessor has achieved the award (or equivalent), at or above the level they are assessing. Alternatively, they must provide supporting evidence that they are able to make valid judgments through experience built up by working in the industry

- must have a working knowledge of the qualification and a full understanding of that part of the award for which they have responsibility for
- must demonstrate current evidence of continuing professional development in a relevant area of practice.

Internal verifiers:

- must hold a valid internal verifier qualification or be working towards suitable qualifications for internal verification, as defined by the Qualification Regulator(s)
- must be occupationally competent in the units they are assessing. Centres must evidence that the internal verifier has achieved the award (or equivalent), at or at or above the level they are verifying, or provide supporting evidence that they are able to make valid judgments
- must have a working knowledge of the qualifications they are internally verifying
- must be either working in the appropriate sector itself OR they must be able to demonstrate they possess practical and up-to-date knowledge of current working practices appropriate to the sector in which they are carrying out verification activities
- Must demonstrate current evidence of continuing professional development in a relevant area of practice.

External verifiers:

- must be familiar with the industry; have up-to-date working knowledge /experience of the technical processes and terminology for which they provide external verification. If appropriate, this experience could be evidenced through professional registration
- must hold valid qualifications in assessment and internal verification and hold, or be working towards valid qualifications for external verification, as defined by the Qualification Regulator.
- must demonstrate current evidence of continuing professional development in a relevant area of practice.

Centre staff may undertake more than one role, eg tutor and assessor or internal verifier, but must never internally verify their own assessments.

Learner entry requirements

City & Guilds does not set entry requirements for these qualifications, although it is expected that candidates will be already engaged within the industry. Candidates should not be registered if they hold from City & Guilds or another awarding body a qualification of a similar level and within the same content area as the relevant diplomas.

Age restrictions

City & Guilds cannot accept any registrations for candidates under 16 as these qualifications are **not** approved for under 16s.

3 Delivering the qualification

Initial assessment and induction

An initial assessment of each candidate should be made before the start of their programme to identify:

- if the candidate has any specific training needs,
- support and guidance, they may need when working towards their qualifications.
- any units they have already completed, or credit they have accumulated which is relevant to the qualifications.
- the appropriate type and level of qualification.

We recommend that centres provide an induction programme, so the candidate fully understands the requirements of the qualification, their responsibilities as a candidate, and the responsibilities of the centre. This information can be recorded on a learning contract.

Support materials

The following resources are available for this qualification:

Description	How to access
Candidate logbook	www.cityandguilds.com
Unit packs	www.cityandguilds.com

Recording documents

Candidates and centres may decide to use a centre devised paper-based or electronic method of recording evidence.

City & Guilds endorses several ePortfolio systems, including our own, **Learning Assistant**, an easy-to-use and secure online tool to support and evidence learners' progress towards achieving qualifications. Further details are available at: www.cityandguilds.com/eportfolios.

City & Guilds has developed a set of *Recording forms* including examples of completed forms, for new and existing centres to use as appropriate. *Recording forms* are available on the City & Guilds website.

Although new centres are expected to use these forms, centres may devise or customise alternative forms, which must be approved for use by the external verifier, before they are used by candidates and assessors at the centre. Amendable (MS Word) versions of the forms are available on the City & Guilds website.

4 Assessment

Summary of assessment methods

This qualification must be assessed in line with EU Skills Core Assessment strategy for September 2020.

This section is broken down into the following assessment sub-sections:

- General – provides the overall approach to assessment in the qualification
- Work-place assessment - description of what is required of the assessment
- Simulation - the criteria and minimum requirements pertaining to this form of assessment
- Realistic working environments - the activities and criteria relating to this form of assessment
- Witness testimony - sector skills council's guidance on this form of evidence
- Knowledge and understanding - guidance on the approach to assessing these criteria

General

These new SCQF qualifications are accredited as competence-based qualifications and require the overwhelming majority of evidence to be collected from the workplace. The assessment methods therefore have not deviated from the previous provision, where evidence to meet the requirements of the standards was gathered by the candidate from the work-place and compiled into a portfolio of evidence, which was validated by the approved assessor and internal verifier and subject to City & Guilds' external verification.

The qualification has been designed to offer choices and progression which recognise candidate competence in working within the three main occupational contexts overhead line work, underground cable work and sub-station work. There is significant inter-location variation in the specific items of plant, apparatus and equipment with which candidates must interact within each of these contexts. Both candidates and assessors therefore must have a detailed knowledge of the specific operational characteristics of the plant, apparatus and equipment with which they work in order to be able to demonstrate, through its use, their achievement of occupational competence as demanded by the units of assessment.

Details of the scope and range of the unit are provided with each unit. In addition to visits from external verifiers, all centres will be required to submit details of assessment planning arrangements and assessment recording forms and systems - these details must include the planned use and design of simulations that meet the requirements on this type of assessment provided below. The external verifier will determine whether or not these are of an acceptable rigour to ensure satisfactory implementation and recording of assessment. The visits to a centre by an external verifier will be planned in advance.:

The following approaches to external quality control are not mandatory as part of the assessment strategy:

- Use of independent assessors (moving the candidate): The requirement for workplace evidence means that it would be inappropriate and logistically uneconomic to make use of an assessment system in which candidates were required to attend a different location or assessment centre.
- Use of independent assessors (moving the assessor): Candidates for the Electrical Power Engineering qualification will typically be in low numbers per centre and widely scattered across the UK. Under these circumstances, the mandatory use of peripatetic assessors would be very costly and offer little added value.
- Use of independent assessment methods (open written response assessment): Due to the variation of plant, apparatus and equipment this type of assessment would remove the flexibility to assess knowledge at a local level.

Work-place assessment

It is expected that all the evidence from the candidate's performance will be drawn from workplace practice and recorded on centre devised documentation. This evidence must show candidates meet the performance criteria consistently in their work, over a period of time. The evidence will also materialise from different workplace situations and be varied in nature - work products, records, discussions as well as observation of, and commentaries on, candidate behaviour.

All of the performance and knowledge criteria for each unit must be evidenced, along with the prescribed scope, range and performance requirements.

It is recommended that effective use be made of available opportunities for evidence collection in line with the following principles:

- Evidence must be valid and genuinely produced by or about the candidate
- Evidence from a range of sources will normally be preferable to repeated examples of evidence from a single source - sole use of one type of evidence will need to be justified
- Assessors should pay due regard to the cost-effectiveness of using varied sources of evidence when planning assessments with a candidate

Simulation

The sector skills council (EU Skills) defines simulated activities as those which are carried out without the environment, resources or equipment found within the workplace and involve acting or other scenarios which are not 'real' work tasks. EU Skills has not identified any specific areas in the qualification that warrant assessment through simulation, however, in the extremely rare instance where it is felt that simulation is required this is only acceptable in relation to those few instances which display one or more of the following characteristics (details of planned simulation must be submitted for approval by centres to their external verifier):

- where health and safety could be compromised by seeking workplace evidence

- where the behaviour or situation under which assessment occurs happens infrequently in the workplace
- where the electricity network, plant or apparatus needs to be placed in an unacceptable operating state to allow for assessment to take place.
- In all cases where the use of evidence from simulations is permitted, this is clearly detailed in the element or unit concerned.

Where simulation is used the environment must be set up to mirror the features of an electricity distribution environment in all of the following aspects:

- nature of the plant, apparatus and equipment
- ambient noise, light and temperature levels
- handling characteristics of materials used
- presence, actions and capabilities of other personnel

Where simulation is used the simulated activity must be designed to mirror the same activity carried out in an electricity distribution environment:

- The urgency with which the activity must be carried out and the time needed to complete it
- The number and sequence of actions needed to complete the activity
- The skills needed to carry out the activity
- The nature and availability of resources needed to carry out the activity
- Access to references and sources of advice and assistance that could be needed if problems arise
- The type of documentation to be completed
- The standards to which the activity must be carried out, including any practices and procedures which require to be followed
- The outcomes which the activity will produce.

Realistic working environments (RWE)

The SSC has provided the following contexts for illustration where assessment in a RWE might be used:

- Where demonstration of emergency shutdown and related safety procedures would be **dangerous and/or disruptive** to plant/environment/individuals; **too costly** such as total plant shutdown or dealing with spillage of dangerous substances
- Where **issues of confidentiality** restrict access to real work opportunities
- Demonstrating specific aspects of the operation which rarely or never occur because of effective quality assurance systems
- The capacity to integrate disparate knowledge to cope with unforeseen events and to solve problems
- Aspects of working relationships and communications for which no opportunity has presented for the use of naturally occurring workplace evidence of candidate performance

Although it is expected that candidates provide all evidence from the work place, the SSC has identified the following types of activities as being potentially suitable for assessment through RWE (these **details of planned simulation must be submitted for approval by centres to their external verifier**):

1. Planning and preparing for emergency response
2. Isolation of the fault and contingency action
3. Fault diagnosis and problem causation

The following conditions for assessment in a RWE **must** be met:

1. Assessments must be carried out under realistic work pressures that are found in the normal industry workplace
2. Assessments must be carried out in conditions and facilities which are typical of those encountered in the normal industry workplace
3. The range of materials, equipment and tools that candidates use must be up-to date and be of the type routinely found in the normal industry workplace environments.
4. All work carried out should be completed in a way, and to a timescale, that is acceptable in the normal industry workplace
5. Candidates must interact with the range of personnel and contractors found in the normal industry workplace
6. Candidates must be expected to achieve a volume of work comparable to that expected in the normal work situation being replicated
7. Candidates must be given workplace responsibilities that will enable them to meet the requirements of the assessment
8. Candidates must show their productivity reflects that found in the work situation being replicated
9. The RWE must take into account legislation, regulations, codes of practice, etc, which pertain to the regulated environment.

Witness testimony

The SSC supports the use of witness testimony as a natural and efficient way of **contributing** to a candidate's source of evidence of competence. Nonetheless, the quality of this type of evidence will be affected by knowledge the witness has about the qualification requirements and their own competence in the occupational role.

As a minimum, witnesses should be:

- occupationally competent with sufficient experience to judge the assessment activity undertaken by others
- fully briefed and clear about the purpose and use of the testimony
- able to demonstrate that they have the necessary expertise in the occupational area for which they are providing testimony
- appropriately inducted to the Awarding Body and assessment centre requirements and have ongoing support by way of access to updating and other issues connected with the qualifications
- Centres must provide arrangements to provide veracity of any witness testimony evidence/signature authenticity.

Recording forms

Candidates and centres may decide to use a paper-based or electronic method of recording evidence - City & Guilds endorses several e-Portfolio systems. Further details are available at: **www.cityandguilds.com/eportfolios**.

Accreditation of prior learning and experience (APEL)

Accreditation of Prior Learning (APL) and Accreditation of Prior Experience and Learning (APEL) recognise the contribution a person's previous experience could contribute to a qualification. As these qualifications are specifically related to the Power sector it is not expected that candidates will present with APEL. However, and in line with the sector skills council Energy & Utility Skills' assessment strategy, City & Guilds supports the use of other qualifications as valuable contributions to evidence of competence.

Where APEL is sought the centre must first confirm this with the external verifier or seek their advice where there is uncertainty.

5 Units

Availability of units

All units can be found in the separate unit pack.

www.cityandguilds.com

Guidance note

To ensure that the back cover and the inside back cover print in the correct position, the document must have an EVEN number of pages.

If this page currently occupies an EVEN numbered page, leave it here and delete this note.

If your document has an ODD number of pages, please remove this page, to allow the back cover to fall on the left-hand page (even number).

Useful contacts

UK learners

General qualification information

E: learnersupport@cityandguilds.com

International learners

General qualification information

E: intcg@cityandguilds.com

Centres

Exam entries, Certificates, Registrations/enrolment, Invoices, Missing or late exam materials, Nominal roll reports, Results

E: centresupport@cityandguilds.com

Single subject qualifications

Exam entries, Results, Certification, Missing or late exam materials, Incorrect exam papers, Forms request (BB, results entry), Exam date and time change

E: singlesubjects@cityandguilds.com

International awards

Results, Entries, Enrolments, Invoices, Missing or late exam materials, Nominal roll reports

E: intops@cityandguilds.com

Walled Garden

Re-issue of password or username, Technical problems, Entries, Results, e-assessment, Navigation, User/menu option, Problems

E: walledgarden@cityandguilds.com

Employer

Employer solutions including, Employer Recognition: Endorsement, Accreditation and Quality Mark, Consultancy, Mapping and Specialist Training Delivery

E: business@cityandguilds.com

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City & Guilds Group

The City & Guilds Group is a leader in global skills development. Our purpose is to help people and organisations to develop their skills for personal and economic growth. Made up of City & Guilds, City & Guilds Kineo, The Oxford Group and ILM, we work with education providers, businesses and governments in over 100 countries.

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