

SKILLS PROGRAMME DOCUMENT



| | | | | | |
|-------------------------|------------|--|----|------------------|----|
| Skills Programme Title | | Energy Performance Certificate Practitioner | | | |
| NQF Level | 5 | Credits | 25 | Duration in days | 35 |
| Skills Programme ID | | SP-220323 | | | |
| Skills Programme Status | Approved | Start Date | | End Date | |
| | | 11/03/2022 | | 11/03/2027 | |
| Last date for enrolment | 11/03/2028 | Last date for achievement | | 11/03/2031 | |

SKILLS PROGRAMME DETAILS

| | | |
|----|-----------------------------------|---|
| 1. | Title | Energy Performance Certificate Practitioner |
| 2. | Sub Title | OFO Code: 311303 EPC Practitioner EPC Auditor |
| 3. | NQF Level | NQF Level 5 |
| 4. | Duration | 35 days |
| 5. | Credits | 25 |
| 6. | Quality Assuring Body | Quality Council for Trades and Occupations (QCTO) |
| 7. | Skills Programme Rationale | <p>The Energy Performance Certificate (EPC) Regulation was Gazetted in South Africa on 8 December 2020 in Gazette No 700 of 2020 by the Minister of Mineral Resources and Energy under section 19(1) of the National Energy Act, 1998 (Act No 34 of 2008) and the deadline for implementation is 9 December 2022. The Regulation incorporates the use of standards for EPCs which are SANS1544:2014 and SANS10400-XA:2011. Accounting Officers of buildings owned, operated and occupied by organs of state with a net floor area of 1,000m² or larger, and building owners of buildings owned occupied and operated other than organs of state with a net floor area of 2,000m² or larger, must all comply, provided that the building:</p> <ul style="list-style-type: none"> • has a dominant occupancy classification in terms of Regulation A20 of the National Building Regulations as A1 (Entertainment and public assembly), A2 (Theatrical and indoor sport), A3 (Place of instruction), or G1 (Offices) • is in operation to meet a particular need associated with the use of the building for a period of two years or longer and has not been subject to major renovation within the past two years of operation <p>The EPC Regulation promotes the improvement of the energy performance of buildings through the mandatory requirement to display EPCs, and the submission of EPCs to establish a National Building Energy Performance Register (NBEPR). The South African National Energy Development Institute (SANEDI) is the entity responsible for maintaining the NBER for the EPC Regulation.</p> <p>South Africa has faced continuous challenges over a number of years with regards to electricity generation and load shedding, and saving energy is to everyone's advantage. Mandating EPCs is a step in the right direction in the building industry to reduce energy wastage as accountability now comes into play. Together with this, South Africa also has the highest unemployment rate in the world, and youth unemployment of qualified engineering graduates have not gone unscathed.</p> <p>For these reasons, the EPC Regulation is being embraced by various government departments with the aim of combining a reduced load on the country's electricity with job creation through this EPC Practitioner</p> |

| | | |
|----|---|---|
| | | <p>Skills Programme for entry level engineering graduates from TVET colleges to enter the green economic development required in South Africa.</p> <p>The EPC Practitioner Skills Programme has already been noticed by government departments such as the unit within Department of Minerals Resources and Energy for gender transformation, as the job tasks are suitable for female engineering TVET graduates. The Presidential Youth Skills Development funding programme has also requested proposals for using the programme once accredited for youth skills development towards employment. The current funders are monitoring and evaluating the outcomes of the programme to model their future grant funding to South African entities for further roll-out of the programme.</p> |
| 8. | Related registered qualification/s | 1. SAQA ID 99426 Occupational Certificate: Energy Efficiency Technician (Energy Audit Technician) |
| 9. | Purpose | <p>An Energy Performance Certificate (EPC) Practitioner assess/audits, analyses and reports on the energy performance of a building, processes and verifies the data and information to be ready for the National Building Energy Performance Register of South African hosted by the South African National Energy Development Institute (SANEDI), and provides a mock Energy Performance Certificate with all relevant supporting information, ready for verification and officiating by a SANAS accredited Inspection Body.</p> <p>The impact and benefit of a training program combined with practical work and mentorship benefits the candidate, the workplace, and the environment.</p> <p>The impact of upskilling or reskilling students from a general qualification towards specialisation, is valuable towards 'personal development, widens career prospects, and enhances skills and employability. This effectively forges career pathways for electrician graduates in a supportive and seamless way while harnessing a dual approach. With the proposed program of training in the energy efficiency for buildings field together with mentorship and practical real-life employment where relevant work and assignments are completed, there is a high probability that during the program energy savings can be identified and implemented, or identified to be implemented, by the workplace companies. This carries a benefit not only to the workplace, but to the project as the opportunities found during the program can be quantified and reported as part of the project achievements. The content to be used in the training and practical is leveraged from an existing Qualification Council for Trades and Occupations (QCTO) qualification and will carry recognition of prior learning (RPL) towards the full qualification should such a candidate be afforded an opportunity in future.</p> <p>Tasks the learners will be able to:</p> <ul style="list-style-type: none"> ● Determine energy audit data requirements ● Determine the energy performance of the building through appropriate measurements ● Analyse energy efficiency data and identify improvement opportunities |

| | | | |
|-----|---------|--|---|
| | | <ul style="list-style-type: none"> • Prepare and present energy audit findings in a report and mock Energy Performance Certificate | |
| 10. | Content | <p><u>Knowledge component:</u> Knowledge modules from ID 99426 are modified, reduced in credit value and sequenced in this order:</p> <ol style="list-style-type: none"> 1. 311303-001-00-KM-03: Fundamental principles of energy NQF, Level 5, Credits 3 2. 311303-001-00-KM-04: Energy conversion and efficiency, NQF Level 6, Credits 2 3. 311303-001-00-KM-05: Fundamentals of electrical energy, NQF Level 5, Credits 6 4. 311303-001-00-KM-11: Theory of energy auditing, NQF Level 5, Credits 1 5. 311303-001-00-KM-01: Policies, regulations and standards relating to energy performance of buildings, NQF Level 5, Credits 1 <p>Total Credits: 13 credits</p> | <p><u>Application component:</u> Practical and Workplace Experience Modules from ID 99426 are modified, reduced in credit value and sequenced in this order:</p> <ol style="list-style-type: none"> 1. 311303-001-00-PM-01, Determine energy audit data requirements for energy performance of a building, NQF Level 5, Credits 1 2. 311303-001-00-PM-02, Measure energy performance of the building, NQF Level 5, Credits 1 3. 311303-001-00-PM-03, Analyse energy data collected for the energy performance of a building, NQF Level 6, Credits 2 4. 311303-001-00-PM-04, Prepare and present energy audit findings of the energy performance of a building, NQF Level 5, Credits 1 5. 311303-001-00-WM-01, Energy audit planning processes for a building system, NQF Level 5, Credits 2 6. 311303001-00-WM-02, Data collection and measurement processes, NQF Level 5, Credits 2 7. 311303001-00-WM-03, Data analysis of the energy performance of a building, NQF Level 6, Credits 2 8. 311303001-00-WM-04, Energy audit reporting processes for building energy performance, NQF Level 5, Credits 1 <p>Total Credits: 12 credits</p> |

| | | |
|-----|---|---|
| 11. | Minimum entry requirements | <ul style="list-style-type: none"> • N4 Electrical Engineering, or • NQF Level 4 with Mathematics and Science, or Technical Maths and Science, or a Technical subject, or • 6 months full time work experience as a qualified artisan |
| 12. | Exit Level Outcomes (ELO) and Associated Assessment Criteria (AAC) | <p>(a) <u>Exit Level Outcome (ELO):</u></p> <p>ELO 1: Demonstrate an understanding of the various forms of energy AAC for ELO 1:</p> <ul style="list-style-type: none"> • Define and discuss the difference between kinetic (potential), chemical, thermal (radiant), mechanical and electrical energy • Define and discuss the terms energy efficiency and energy density • Explain the 11 different metric units that are used in energy calculations, their applications and how they are measured <p>The learner will be able to:</p> <ol style="list-style-type: none"> a. Identify the different energy sources, costs and their related general efficiencies for different equipment/processes. b. Identify, obtain and record related energy performance data required for and energy audit. c. Understand the energy audit process and the required sequential steps. d. Plan an energy audit and where to obtain the related data inputs. e. Calculate the related metrics as required for an energy audit. <p>ELO 2: Demonstrate an understanding of energy efficiency AAC for ELO 2:</p> <ul style="list-style-type: none"> • Compare kinetic (potential), chemical, thermal (radiant), mechanical and electrical energy • Differentiate between energy efficiency and energy density • Distinguish between energy and power • Differentiate between the following electricity principles: voltage, current, power triangle, AC/DC, power factor correction, harmonics, and electrical circuitry • Compare the following concepts: temperature, psychrometry, heat flow, and heat loss in relation to energy efficiency • Compare the calculation of power, energy, energy balance and point of use cost <p>The learner will be able to:</p> <ol style="list-style-type: none"> a. Determine what to measure where in order to obtain the energy audit requirements. b. Utilise appropriate methods to translate the data obtained into a baseline for reference. c. Determine current energy efficiencies and Point of Use costs. d. Predict possible energy efficiencies and Point of Use costs. e. Identify and list possible Energy Management Opportunities. f. Quantify the identified Energy Management Opportunities. g. Provide a report and recommendations on the energy audit/EPC readiness. <p>ELO 3: Demonstrate an understanding of the key aspects of</p> |

electrical energy and the measurement of usage thereof.

AAC for ELO 3:

- Explain and discuss voltage, current, power and demand and demand management
- Explain and discuss the effect that different loads have on currents, and power factor
- Explain and discuss the concepts power factor (including the power triangle) and the importance thereof
- Explain and discuss the concept total harmonic distortion (THD) (incl. voltage and current) and the importance thereof
- Discuss methods to calculate power, voltage, current and power factor in alternating current circuits
- Discuss the importance of, and methods to correct the power factor
- Explain and discuss methods and tools that can be used to calculate energy efficiency and electrical equipment efficiency

The learner will be able to:

- a. Determine what to measure where in order to obtain the energy EPC audit requirements.
- b. Utilise appropriate methods to translate the data obtained into the required information for an EPC assessment.

ELO-04: Demonstrate an understanding of the purpose and steps in the auditing process and categories of data to be collected

AAC for ELO 4:

- Illustrate the function and purpose of an energy audit and the benefits thereof
- Compare and explain the types of energy audits (including: BEA, PQA, PPEA, PEA, TPA, CPA and EDA, and Level 1, 2, and 3)
- Discuss the purpose and elements of the energy audit planning and the opening meeting
- Discuss the purpose, elements of and list the types of data to be collected
- Discuss the purpose and elements of the measurement plan
- Discuss the purpose of conducting a site visit and the elements to be considered
- Discuss the purpose and elements of analysis
- Discuss the purpose and elements of energy audit reporting
- Discuss the purpose and elements of the closing meeting
- Differentiate between the sources of historical energy consumption data and explain the significance thereof
- Differentiate between the sources of weather data and explain the significance thereof
- Differentiate between the sources of equipment data and explain the significance thereof
- Differentiate between the sources of on-going demand and consumption data and explain the significance thereof
- Differentiate between the sources of building (including configuration and integration) and equipment information and explain the significance thereof
- Differentiate between the sources of building and equipment information and explain the significance thereof

| | | |
|-----|---|--|
| | | <ul style="list-style-type: none"> • Differentiate between the significance of operation schedules and maintenance records <p>The learner will be able to:</p> <ol style="list-style-type: none"> Understand and apply the correct methodology to interpret and analyse the data for an EPC assessment. Calculate the related metrics as required for an EPC. <p>ELO-05: Display Energy Performance Certificates on buildings and report data to Energy Performance Register as per government standards and regulations within legislative framework. AAC for ELO 4:</p> <ul style="list-style-type: none"> • Explain the integration of the standards and the regulation • Discuss the role players within the Energy Performance Certificates for Buildings and how a Certificate is issued, and data submitted to the National Building Energy Performance Register • Illustrate the application process of an Energy Performance Certificate • Define the Energy Performance Certificate Regulation and SANS1544 terms <p>The learner will be able to:</p> <ol style="list-style-type: none"> Report on the energy audit process followed. Collate the energy audit findings to quantify the related metrics. Structure the energy use assessment findings in a coherent report. Present the energy use assessment report to a client to enable a client to make informed decisions. |
| 13. | <p>Continuous Assessment & Final Supervised Assessment (FISA)</p> <p>The following assessments must be conducted by the accredited SDP:</p> <ol style="list-style-type: none"> 1. Continuous Assessment 2. Final Integrated Supervised Assessment <p><u>Continuous Assessment:</u></p> <p>The continuous assessments must be completed by the SDP throughout the training period in accordance with the outcomes provided under "Associated Assessment Criteria" [no.12]</p> <p>This may consist of a variety of methods, e.g. Formative assessments, written assessments, practical assessments, oral assessments, work integrated learning assessment or simulation, or any other forms of integrated learning assessment set to assist the learner in the learning process.</p> <p>It is mandatory for Summative assessments to take place at the end of modules/topics (or sections) which must be formally recorded, and be available for monitoring and/or</p> | <p><u>Continuous Assessment</u></p> <ul style="list-style-type: none"> •Continuous assessment through any format to ensure that all assessment criteria of each module have been met. Constructive feedback during these assessments must be provided with the aim of learner improvement in the learning process. •After each module, a summative assessment must be completed by each learner and recorded by the SDP. Evidence of the summative assessment conducted must be kept for record purposes for a period of 3 years. • Learners must be declared Competent ('C') in all practical summative assessments. • Learners must pass all knowledge modules with a minimum of 60%. • Once learners have completed all modules successfully, they may continue to the Final Integrated Supervised Assessment. <p><u>Final Integrated Supervised Assessment (FISA)</u></p> <p>All learners gain entrance to the FISA by successfully completing ALL modules.</p> <ul style="list-style-type: none"> • All Exit Level Outcomes must be covered in the FISA |

| | |
|---|--|
| <p>evaluation by the QCTO.</p> <p><u>Final Integrated Supervised Assessment (FISA)</u></p> <p>The Final Integrated Supervised Assessment must be clear in what will be assessed, what the learner must be able to do, know, produce, demonstrate, etc. according to the required standards as set in the information provided under "Final Integrated Supervised Assessment".</p> <p>The ideal method to be used is a practical assessment in which the learner demonstrates the practical skills mastered, as well as the ability to problem-solve. A marking rubric or compliance checklist must be completed for each learner, and provide more evidence than just being ticked off – comments to support C or NYC judgements must be provided, to indicate that embedded knowledge has also been assessed during this practical assessment.</p> <p>The accredited SDP must ensure the following processes and documentation are completed in order for the QCTO to approve these results for Certification (templates available on QCTO Website):</p> <ol style="list-style-type: none"> Upload learner information in the format prescribed by the QCTO, within 5 days of starting the Skills Programme, also indicating start and end dates, as well as the scheduled date(s) of the FISA. Develop and moderate the FISA according to the standards set for the FISA task, bearing in mind the achievement of the purpose of this skills programme as well as the stipulated ELOs. (The moderator should be an SME other than the one who developed the instruments). Conduct the FISA under strict examination supervised conditions according to a set date and time. The QCTO may conduct sample monitoring visits on the conduct of the FISA. Complete all relevant sections of the Final Moderation Report. Submit captured results (on same spread sheet used in [a]), as well as above Moderation Report to the QCTO together with a copy of the assessment instrument and marking guideline/compliance rubric used. The QCTO may request the completed marking rubric/compliance checklist for selected learners together with a copy/photos of the learner's evidence before final approval of results. After approval, results are recommended for certification. The QCTO reserves the right not to approve results that are not submitted within 21 days of the date of the FISA, or do not comply with these requirements and standards as stipulated herein. | <ul style="list-style-type: none"> • Format of FISA: A practical assessment integrating the Exit Level Outcomes, and verbal assessment of embedded knowledge by the assessor before, during or after the FISA. All Exit Level Outcomes must be covered in the Final Integrated Supervised Assessment. <p>The FISA may not contain any assessments used in the "Continuous Assessment" process (thus no re-assessment). The FISA is also not allowed to be repeated verbatim for future FISAs.</p> <p>Special considerations should be made for candidates with special learning needs.</p> <p>Standards for final practical tasks (FISA):</p> <p>The learner should be provided with a brief/job card/task to demonstrate what the learner should show, know or produce in a product, relevant to the Exit Level Outcomes. This is the section where the learner must show <i>applied competency (what the learner must be able to do, according to the expected standard)</i></p> <p>FISA INSTRUMENT (Developed, Moderated, Conducted and Assessed by the SDP):</p> <p>A brief/case study/assignment/task(s) must be provided to the learner in order to produce a final sample product of an EPC. It should clearly enable the learner to analyse and report on the energy performance of a building, process and verify the data and information to be ready for the National Building Energy Performance Register of South African hosted by the SANEDI, and provide a mock energy performance certificate with all relevant supporting information, ready for verification and officiating by a SANAS accredited Inspection Body. Where relevant, the learner must be provided with required templates and the applicable references that he/she would use in the workplace.</p> <p>A rubric must be designed to assess learners' required competencies.</p> <p>EVIDENCE REQUIRED BY EACH LEARNER:</p> <p>The practical task(s) shall require the learner to produce the following:</p> <ul style="list-style-type: none"> • The task(s) provided should enable learners to demonstrate required knowledge and skills to produce a mock Energy Performance Certificate (EPC), according to the expected standard. • The learner must have an opportunity to show applied skills and required knowledge expected of an Energy Performance Practitioner in order to: <ul style="list-style-type: none"> ○ Determine and collate the building data required for energy audits ○ Analyse audit data and present credible and verified findings for the National Building Energy Performance Register |
|---|--|

| | | |
|-----|--|---|
| | | <p>During or after the conduct the above, strategic, well-timed questions should be asked of the learner to assess embedded knowledge gained during the skills programme, as well as critical thinking and problem-solving skills: for e.g.</p> <ul style="list-style-type: none"> • "Why.....?" • "What would happen if ...?" • "When is done, what would the result be?" • "How would you deal with?" • Etc. <p>The marking rubric/compliance checklist used to assess these competencies must include a section for the assessor/facilitator used in this session to make a note of competencies shown, (or not shown), as well as the questions that were asked, and a summary of the learner's answers, and state whether these are of the acceptable standard or not.</p> <p>The marking rubric/compliance checklist compiled should contain specific areas marked with an asterisk (*) as compulsory sections in order for the learner to be declared C (Competent). Compulsory sections are when the safety of the candidate or others would be affected if incorrectly completed, and are absolute requirements for the specific skill demonstrated.</p> <p>Learners who complete this skills programme will accumulate credits towards the relevant full or part qualification. The Credit Accumulation and Transfer (CAT) Policy may apply to these learners.</p> |
| 14. | Recognition of Prior Learning | <ul style="list-style-type: none"> • Learners may gain access to the skills programme through RPL for Access as provided for in the QCTO RPL Policy. RPL for access is conducted by an accredited institution, skills development provider or workplace accredited to offer that specific skills programme. • Learners who have already acquired competencies of modules/topics of a skills programme may be exempted from those through RPL. Such learners will be awarded credits towards the skills programme. Gap training to be completed as identified in this process. • Learners who complete this skills programme may accumulate credits towards the relevant full or part qualification. The Credit Accumulation and Transfer (CAT) Policy shall apply to these learners. |
| 15. | Work Opportunities/further learning | <p>The EPC Practitioner Skills Programme is the first step in the green skills economy providing the fundamental knowledge related to electrical energy and building system audits for energy performance. Further modules in the Curriculum: Energy Audit Technician, can be used to develop the learning further into more in-depth areas of energy such as mechanical energy, thermal energy, the complete building envelope optimization, and energy systems such as lighting, heating ventilation</p> |

| | | |
|--|--|--|
| | | <p>and cooling, motors, steam, compressed air, hot water heating, pumps, fans as well as renewable energy.</p> <p>With the requirements of the EPC Regulation which is mandatory to comply with by December 2022, or the relevant buildings facing a penalty in accordance with the National Energy Act of up to R5 million a building, the job opportunities are immediate. Currently, there are only five (5) accredited bodies to verify and sign for EPCs, and two Certified EPC Practitioners to assist them in getting the buildings ready for verification for the EPC. With an estimated 160,000 buildings to comply by December 2022 – the simple maths tells you over 600 buildings a day need to be audited for an EPC in a year. The Regulation only stipulates certain building categories, and more will follow. In addition, the EPC is only valid for five (5) years, where after this needs to be redone. Therefore, there is a continuous supply of work.</p> <p>The accredited bodies that need to verify the EPC have conflict of interest restrictions and may not according to their accreditation by the South African National Accreditation System (SANAS) implement improvements to the buildings for a better energy performance rating. An EPC Practitioner, merely audits the building to get it ready for verification, therefore there is no Conflict of Interest and further training in the Energy Audit Technician curriculum will therefore enable them to provide a list of opportunities for improvements based on the EPC audit, and thereafter also implement the improvement opportunities so that the client's building can achieve a more energy efficient rating.</p> <p>The EPC Practitioner qualification will enable the learner to work for the responsible entities, and various stakeholders in the industry, and entrepreneurship for an EPC Practitioner company is a real possibility. In addition, existing companies such as energy services companies, and electrical contractors, whom already have an existing building database, can use the EPC Practitioner as an employee that can generate and additional income stream for the business thereby covering their own job opportunity and pay.</p> <p>Besides self-employment, job opportunities such as:</p> <ul style="list-style-type: none">• Electrical contractors• Facilities management companies• Energy services companies |
|--|--|--|

| | | |
|-----|---|---|
| | | <ul style="list-style-type: none"> • Property developers • Government • Accredited inspection bodies for EPCs <p>An EPC Practitioner is also an ideal starting point towards becoming an auditor or assessor of buildings for a SANAS EPC Inspection Body and may qualify to sign as a Technical Signatory provided there is sufficient experience confirmed as assessed by a SANAS Assessor.</p> |
| 16. | Skills Development Provider Accreditation Requirements | <p><i>Physical Requirements:</i></p> <ul style="list-style-type: none"> • Hand-outs, learning materials and resources • Computer, software, and internet for online remote learning • The latest Regulation and the standards of Energy Performance Certificates • Learning material must have the version of the Regulation and standard indicated on the learning materials <p>For practical:</p> <ul style="list-style-type: none"> • The provider must have either a simulation tool, or a physical building of 1,000m² or larger, or case studies or data sets containing operational history, data sources, energy consuming systems, operational data, and equipment, the energy distribution system and its management, building plans and layouts, process flow diagrams, the regulations and standards, data sheets containing current available measured data on energy consuming systems, processes and equipment (including energy and fuel consumption data, metered energy consumption specified in the scope statements. • Computer, software, internet connection, multi-meter and measuring tape <p><i>Human Resource Requirements:</i></p> <ul style="list-style-type: none"> • Facilitator should have a qualification at the equivalent level qualification of the qualification outcomes, or higher, or proven experience that includes competencies related to energy, and energy performance of buildings • Facilitator/learner ratio 1 to 25 <p>For Practical:</p> <ul style="list-style-type: none"> • Facilitator/learner ratio 1 to 10 <p><i>Legal Requirements:</i></p> <ul style="list-style-type: none"> • None <p><i>Note:</i> See Curriculum Document for Criteria for Workplace Approval</p> |
