




# ENSURING THE EXPERTISE TO GROW SOUTH AFRICA

**Criteria and Processes for Recognition of  
Educational Qualifications and Individual  
Assessment for Professional Categories**

**E-17-PRO**

**REVISION 0: 14 February 2023**

<b>Document No.:</b> E-17-PRO	<b>Revision No.:</b> 0	<b>Effective Date:</b> 14/02/2023	
<b>Subject: Criteria and Processes for Recognition of Educational Qualifications and Individual Assessment for Professional Categories</b>			
<b>Compiled by:</b> Assistant Manager	<b>Approved by:</b> Manager	<b>Next Review Date:</b> 14/02/2027	Page 2 of 35
<b>Date:</b> 08/12/2022	<b>Date:</b> 12/12/2022		


## CONTENTS

LIST OF TABLES.....	4
DEFINITIONS .....	5
BACKGROUND .....	6
1. PURPOSE OF THIS DOCUMENT .....	6
2. BACKGROUND TO EDUCATIONAL REQUIREMENT FOR REGISTRATION.....	7
2.1 First and second methods of meeting the educational requirements .....	8
2.2 The third and fourth methods of meeting the educational requirements.....	8
3. IMPLEMENTATION OF POLICY FOR METHODS (i) and (ii).....	9
3.1 To satisfy the educational requirements by method (i).....	9
3.2 Method (ii) recognised programmes .....	11
4. PROCESS AND CRITERIA FOR APPLICANTS UNDER METHODS iii AND iv.....	12
4.1 Process and criteria for method iii .....	12
4.2 Process and criteria for method iv .....	14
4.2.1 Mechanisms for assessment.....	14
4.2.2 Additional requirements .....	14
5. APPLICANTS WHO DO NOT MEET REQUIREMENTS .....	20
6. COMPOSITION OF INTERVIEW AND ORAL EXAMINATION PANEL .....	21
7. FORMS OF ASSESSMENT .....	21
7.1 Satisfying Criteria 1.1 And 1.2 by completing approved fundamental courses at an educational institution.....	21
7.2 Satisfying Criteria 1.3 and 2 by completing approved exit-level courses at an educational institution.....	22
7.3 Satisfying engineering fundamentals and discipline-specific examinations (Criteria 1, 2 and 3).....	23
7.4 Satisfying the design requirement (Criteria 4 and 6) .....	23
7.5 Satisfying the experimental requirement (Criterion 5) .....	24
7.5.1 Professional or Candidate Engineer.....	24

### CONTROLLED DISCLOSURE


When downloaded for the ECSA Document Management System, this document is uncontrolled and the responsibility rest with the user to ensure that it is in line with the authorized version on the ECSA Document Management System.

QM-TEM-001 Rev 1 – ECSA Policy/Procedure

<b>Document No.:</b> E-17-PRO	<b>Revision No.:</b> 0	<b>Effective Date:</b> 14/02/2023	
<b>Subject: Criteria and Processes for Recognition of Educational Qualifications and Individual Assessment for Professional Categories</b>			
<b>Compiled by:</b> Assistant Manager	<b>Approved by:</b> Manager	<b>Next Review Date:</b> 14/02/2027	Page 3 of 35
<b>Date:</b> 08/12/2022	<b>Date:</b> 12/12/2022		

7.5.2 Professional or Candidate Engineering Technologist .....	24
7.5.3 Professional or Candidate Engineering Technician .....	25
7.6 Satisfying criteria 7 and 8 .....	25
8. LIMITATIONS ON ASSESSMENT .....	26
9. ACCREDITED QUALIFICATIONS FOR REGISTRATION AS A CANDIDATE OR PROFESSIONAL IN ENGINEERING TECHNOLOGIST AND ENGINEERING TECHNICIAN CATEGORIES .....	27
10. ALTERNATIVE ROUTE FOR QUALIFICATION/ASSESSMENT FOR REGISTRATION AS PROFESSIONAL TECHNOLOGIST AND/OR PROFESSIONAL TECHNICIAN .....	27
11. FOREIGN NON-ACCREDITED QUALIFICATIONS QUALIFICATION ASSESSMENTS .....	29
12. APPEALS.....	29
REVISION HISTORY .....	30
Appendix A: Information for applicants regarding evaluation of qualifications, individual evaluation and proceeding by methods (iii) or (iv).....	31
Appendix B: Syllabus for fundamental engineering sciences.....	32

**CONTROLLED DISCLOSURE**


<b>Document No.:</b> E-17-PRO	<b>Revision No.:</b> 0	<b>Effective Date:</b> 14/02/2023	
<b>Subject: Criteria and Processes for Recognition of Educational Qualifications and Individual Assessment for Professional Categories</b>			
<b>Compiled by:</b> Assistant Manager	<b>Approved by:</b> Manager	<b>Next Review Date:</b> 14/02/2027	Page 4 of 35
<b>Date:</b> 08/12/2022	<b>Date:</b> 12/12/2022		

## LIST OF TABLES

Table 1: Criteria for substantial equivalence for the Candidate and Professional Engineer .	15
Table 2: Criteria for substantial equivalence for the Candidate and Professional Engineering Technologist .....	17
Table 3: Criteria for substantial equivalence for the Candidate and Professional Engineering Technician .....	19
Table 4: Fundamental engineering sciences: Engineer Category .....	26
Table 5: Recognition of alternative route qualifications.....	28

### CONTROLLED DISCLOSURE

When downloaded for the ECSA Document Management System, this document is uncontrolled and the responsibility rest with the user to ensure that it is in line with the authorized version on the ECSA Document Management System.  
QM-TEM-001 Rev 1 – ECSA Policy/Procedure

<b>Document No.:</b> E-17-PRO	<b>Revision No.:</b> 0	<b>Effective Date:</b> 14/02/2023	
<b>Subject: Criteria and Processes for Recognition of Educational Qualifications and Individual Assessment for Professional Categories</b>			
<b>Compiled by:</b> Assistant Manager	<b>Approved by:</b> Manager	<b>Next Review Date:</b> 14/02/2027	Page 5 of 35
<b>Date:</b> 08/12/2022	<b>Date:</b> 12/12/2022		

## DEFINITIONS


**Engineering Discipline:** A generally recognised, major subdivision of engineering such as the traditional disciplines of Chemical, Civil and Electrical Engineering; or a cross-disciplinary field of comparable breadth, including combinations of engineering fields, for example, Mechatronics; or the application of engineering in other fields, for example, Bio-Medical Engineering

**Sub discipline:** A generally recognised practice area or major subdivision within an engineering discipline, for example, Structural and Geotechnical Engineering within Civil Engineering

**Substantial equivalence:** (applied to educational programmes) Two programmes, while not meeting a single set of criteria in detail, provide their respective graduates with knowledge and abilities to enable the graduates to undertake the same work and professional development.

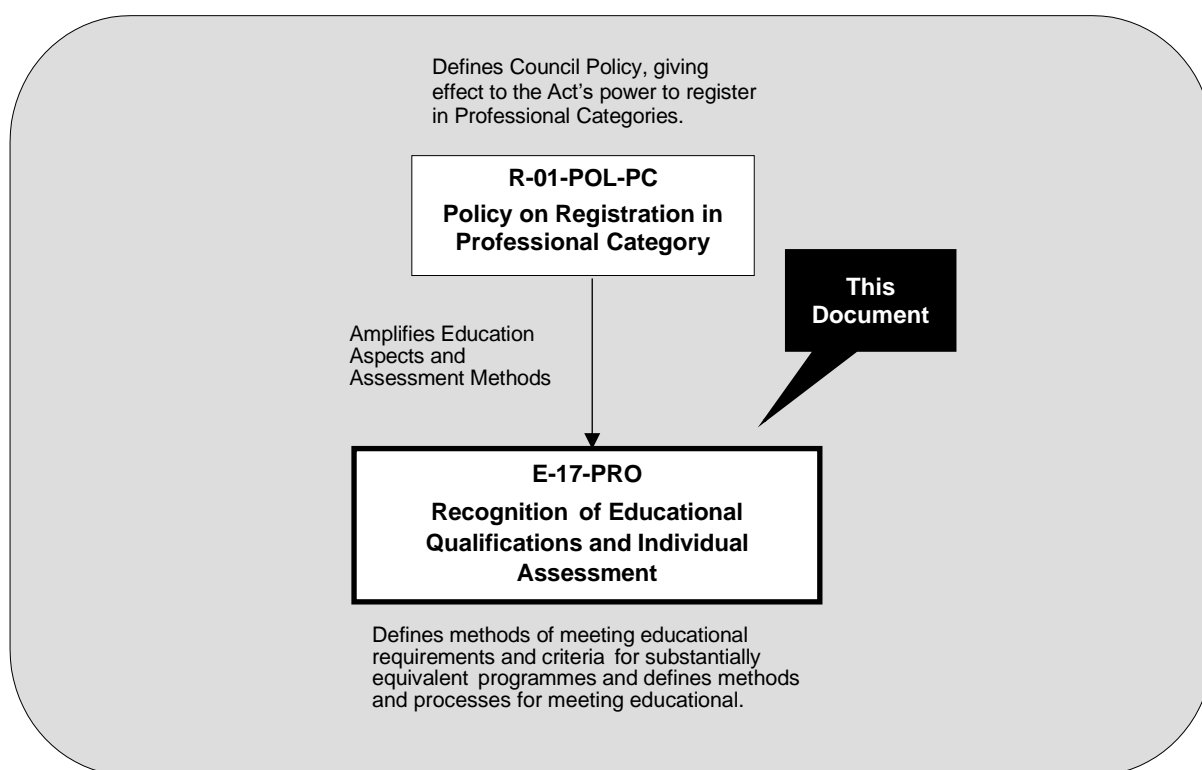
### CONTROLLED DISCLOSURE

When downloaded for the ECSA Document Management System, this document is uncontrolled and the responsibility rest with the user to ensure that it is in line with the authorized version on the ECSA Document Management System.  
QM-TEM-001 Rev 1 – ECSA Policy/Procedure

<b>Document No.:</b> E-17-PRO	<b>Revision No.:</b> 0	<b>Effective Date:</b> 14/02/2023	
<b>Subject: Criteria and Processes for Recognition of Educational Qualifications and Individual Assessment for Professional Categories</b>			
<b>Compiled by:</b> Assistant Manager	<b>Approved by:</b> Manager	<b>Next Review Date:</b> 14/02/2027	Page 6 of 35
<b>Date:</b> 08/12/2022	<b>Date:</b> 12/12/2022		

## BACKGROUND

The illustration below presents the documents that define the Engineering Council of South Africa (ECSA) system for the evaluation of qualifications. The illustration also locates the current document.




**Figure 1: Documents defining the ECSA evaluation of qualifications.**

## 1. PURPOSE OF THIS DOCUMENT

This document defines the criteria and evaluation processes for recognition of educational qualifications and the assessment of the level of educational achievement of applicants in candidate and professional categories.

### CONTROLLED DISCLOSURE

When downloaded for the ECSA Document Management System, this document is uncontrolled and the responsibility rest with the user to ensure that it is in line with the authorized version on the ECSA Document Management System.  
QM-TEM-001 Rev 1 – ECSA Policy/Procedure

<b>Document No.:</b> E-17-PRO	<b>Revision No.:</b> 0	<b>Effective Date:</b> 14/02/2023	
<b>Subject: Criteria and Processes for Recognition of Educational Qualifications and Individual Assessment for Professional Categories</b>			
<b>Compiled by:</b> Assistant Manager	<b>Approved by:</b> Manager	<b>Next Review Date:</b> 14/02/2027	Page 7 of 35
<b>Date:</b> 08/12/2022	<b>Date:</b> 12/12/2022		

The document is structured as follows:

- **Section 2** reviews the statutory requirements and policy for educational achievement for registration and the methods of satisfying the educational requirements.
- **Section 3** expands on the policy for holders of accredited qualifications or qualifications recognised under an international education agreement.
- **Section 4** details the evaluation of qualifications other than accredited or recognised qualifications and **the evaluation of individual academic standing**.
- **Section 5** describes practice in the case of applicants who do not meet the normal educational requirements.
- **Section 6** presents the composition of the interview and oral examination panel.
- **Section 7** describes the individual assessment table of the criteria.

The document also lists the educational requirements for Candidate and Professional Certificated Engineers in Tables 1 to Table 3 but does not cover the cases of applicants for registration via a Mutual Exemption Agreement or an International Registration Agreement.

## 2. BACKGROUND TO EDUCATIONAL REQUIREMENT FOR REGISTRATION


The Engineering Profession Act, 46 of 2000 requires that applicants who wish to register in a professional category or in a candidate category must satisfy Council that they have:

- (a) demonstrated their competence as measured against standards determined by the Council for the relevant category of registration; and
- (b) passed any additional examinations and fulfilled any additional requirements that may be determined by Council.

The latter is referred to as the educational requirement for registration. The determination of standards by Council is embodied in the policy (document **R-01-POL-PC**). The various ways of meeting the educational requirements are summarised below.

The educational requirement for registration as a candidate or a professional is normally an accredited qualification and other assessment, or a qualification recognised under an

### CONTROLLED DISCLOSURE

<b>Document No.:</b> E-17-PRO	<b>Revision No.:</b> 0	<b>Effective Date:</b> 14/02/2023	
<b>Subject: Criteria and Processes for Recognition of Educational Qualifications and Individual Assessment for Professional Categories</b>			
<b>Compiled by:</b> Assistant Manager	<b>Approved by:</b> Manager	<b>Next Review Date:</b> 14/02/2027	Page 8 of 35
<b>Date:</b> 08/12/2022	<b>Date:</b> 12/12/2022		

international agreement. This policy provides further detail on meeting the requirements via accredited or recognised qualifications and other assessment methods. The current policy also defines the mechanism for meeting the educational requirements for registration as a candidate or a professional for persons without accredited or recognised qualifications.

The ECSA policy on registration (document **R-01-POL-PC**) recognises four methods for meeting the educational requirements prior to applying for candidate or professional registration in the applicable category.

## 2.1 First and second methods of meeting the educational requirements

Applicants satisfy the educational requirements if they:

- (i) hold an accredited qualification or an acceptable combination of accredited qualifications prescribed for the category; or
- (ii) hold a qualification or a combination of qualifications recognised under an international academic agreement relevant to the category.


## 2.2 The third and fourth methods of meeting the educational requirements

These methods provide the means for an applicant to demonstrate educational standing that is substantially equivalent to an accredited qualification for the category of candidate or professional registration. The applicant must demonstrate one or more of the following:

- (iii) The applicant holds a qualification or a combination of qualifications that have been determined using case-by-case evaluation to satisfy criteria for substantial equivalence to an accredited qualification for the category by:
  - the qualification(s) being awarded in a jurisdiction or by a provider that has a record of quality or a quality assurance system known to the ECSA; or
  - examination of detailed documentation on the qualification(s) reflecting substantial equivalence.
- (iv) The applicant presents a combination of evidence determined by Council for the category that indicates an individual level of educational achievement against criteria

### CONTROLLED DISCLOSURE



<b>Document No.:</b> E-17-PRO	<b>Revision No.:</b> 0	<b>Effective Date:</b> 14/02/2023	
<b>Subject: Criteria and Processes for Recognition of Educational Qualifications and Individual Assessment for Professional Categories</b>			
<b>Compiled by:</b> Assistant Manager	<b>Approved by:</b> Manager	<b>Next Review Date:</b> 14/02/2027	Page 9 of 35
<b>Date:</b> 08/12/2022	<b>Date:</b> 12/12/2022		

demonstrating that it is substantially equivalent to an accredited qualification. Evidence may include:

- qualification(s) or credits towards qualifications not presented under (iii); or
- completion of examinations or other forms of assessment set or prescribed by Council; or
- portfolio(s) of evidence of work and other outputs presented for assessment; or
- other evidence of prior learning presented for assessment.

Detailed requirements for the various methods of satisfying the educational requirements are laid out in the subsequent sections.


### **3. IMPLEMENTATION OF POLICY FOR METHODS (i) AND (ii)**

#### **3.1 To satisfy the educational requirements by method (i)**

The applicant must hold an accredited qualification or acceptable combination of accredited qualifications prescribed for the category. Qualifications accredited by the ECSA as meeting the educational requirements for a category are listed in the documents referred to below. Graduates are recognised as meeting the educational requirements for the category if they completed the programme in a year within the period of validity of the accreditation indicated indicated in (a) to (c) below. This provision applies to the following:

- (a) All BEng-type programmes in Lists A and B of document **E-20-PE** for Candidate or Professional Engineer applicants.
- (b) All National Diploma and Diploma programmes listed in document **E-20-PN** but contingent upon satisfying subject combinations specified in 1 below for Candidate or Professional Engineering Technician applicants.
- (c) All BTech degree programmes listed in document **E-20-PT** but contingent upon satisfying subject combinations specified in 6 below for Candidate or Professional Engineering Technologist applicants.

**CONTROLLED DISCLOSURE**

<b>Document No.:</b> E-17-PRO	<b>Revision No.:</b> 0	<b>Effective Date:</b> 14/02/2023	
<b>Subject: Criteria and Processes for Recognition of Educational Qualifications and Individual Assessment for Professional Categories</b>			
<b>Compiled by:</b> Assistant Manager	<b>Approved by:</b> Manager	<b>Next Review Date:</b> 14/02/2027	Page 10 of 35
<b>Date:</b> 08/12/2022	<b>Date:</b> 12/12/2022		


- (d) All BEng Tech (Hons) degree programmes listed in document **E-09-PT** but contingent upon satisfying subject combinations specified in 6 below for Candidate or Professional Engineering Technologist.
- (e) All PGDip programmes listed in document **E-09-PGDip** but contingent upon satisfying subject combinations specified in 6 below for Candidate or Professional Engineering Technologist
- (f) All Adv Dip Eng degree programmes listed in document **E-05-PT** but contingent upon satisfying subject combinations specified in 6 below for Candidate or Professional Engineering Technologist

Recognition of accredited National Diplomas and the suite of qualifications in the new Higher Education Qualifications Framework (HEQSF) specified below in 1–3 as meeting the educational requirements towards technician registration and recognition of an accredited BTech degree and the new HEQSF suite of qualifications listed below in 4–8 as meeting the educational requirements towards technologist registration are contingent upon the subjects contained in the curriculum.

The criteria for an acceptable curriculum are as follows:

1. **National Diploma:** As required under NATED 151 and subject to variations permitted by the Education Committee (EC) from time to time.
2. **Diploma in Engineering:** As required by document **E-02-PN**.
3. **Diploma in Engineering Technology:** As required by document **E-08-PN**.
4. **BTech:** As required under NATED 151 with at least 0.625 NATED credits in engineering subjects relevant to the designation of the degree and subject to variations permitted by the EC from time to time.
5. **Bachelor of Engineering Technology:** document **E-02-PT**.
6. **Advanced Diploma in Engineering:** document **E-08-PT**.

**CONTROLLED DISCLOSURE**

<b>Document No.:</b> E-17-PRO	<b>Revision No.:</b> 0	<b>Effective Date:</b> 14/02/2023	
<b>Subject: Criteria and Processes for Recognition of Educational Qualifications and Individual Assessment for Professional Categories</b>			
<b>Compiled by:</b> Assistant Manager	<b>Approved by:</b> Manager	<b>Next Review Date:</b> 14/02/2027	Page 11 of 35
<b>Date:</b> 08/12/2022	<b>Date:</b> 12/12/2022		

7. **Bachelor of Engineering Technology Honours:** document E-09-PT.

8. **Postgraduate Diploma in Engineering Technology:** document E-09-PGDip.

### 3.2 Method (ii) recognised programmes

To satisfy the educational requirements, the applicant must hold a qualification or a combination of qualifications that is recognised by one of the following:


- **The Washington Accord:** The international academic agreement relevant to the categories of Candidate and Professional Engineer.
- **The Sydney Accord:** The international academic agreement relevant to the categories of Candidate and Professional Engineering Technologist.
- **The Dublin Accord:** The international academic agreement relevant to the categories of Candidate and Professional Engineering Technician.

The signatories to the various accords are identified on the **International Engineering Alliance website** ([www.ieagreements.org](http://www.ieagreements.org)). Each signatory maintains its list of accredited programmes. Graduates are recognised as meeting the educational requirements if they completed the programme in a year within the period of validity of the accreditation after the admission date of the signatory to the relevant accord.

Programmes accredited by organisations holding provisional status in an accord are not recognised by the ECSA. Applicants holding such qualifications must follow the qualification or individual evaluation methods (iii) or (iv).

In cases where a qualification or a combination of qualifications accredited by an accord signatory prior to the entry of the signatory to the accord is considered to be substantially equivalent to an accredited qualification, such qualifications must be listed as qualifications for accelerated processing provided for in (a) in Section 4.1.

#### CONTROLLED DISCLOSURE

Document No.: E-17-PRO	Revision No.: 0	Effective Date: 14/02/2023	
Subject: Criteria and Processes for Recognition of Educational Qualifications and Individual Assessment for Professional Categories			
Compiled by: Assistant Manager	Approved by: Manager	Next Review Date: 14/02/2027	Page 12 of 35
Date: 08/12/2022	Date: 12/12/2022		

#### 4. PROCESS AND CRITERIA FOR APPLICANTS UNDER METHODS iii AND iv

##### 4.1 Process and criteria for method iii

An applicant for candidate or professional registration in a category who does not hold an accredited qualification, or a recognised qualification must apply for educational evaluation before applying for registration.

The criteria for substantial equivalence to an accredited qualification for the category are defined in the following tables:

- Table 1 for the categories of Candidate and Professional Engineer
- Table 2 for the categories of Candidate and Professional Engineering Technologist
- Table 3 for the categories of Candidate and Professional Engineering Technician.

Recognition of educational achievement is granted for individual criteria for stated categories. Criteria may be satisfied by *one* of the following:


- Demonstrating compliance of qualifications with the qualifications evaluation (QE) criteria stated in Tables 1, 2 or 3, column 1.
- Assessing the applicant against the individual assessment (IA) criteria stated in Tables 1, 2 or 3, column 2.

After evaluation, a statement of full or partial recognition of educational achievement is issued to the applicant, stating the criteria satisfied and the relevant category for each criterion satisfied.

Applicants who seek to meet the educational requirements by method (i), (ii) or (iii) and who provide evidence that they have been continuously in training and practice for 10 years since graduation must be evaluated in terms of the policy **R-01-POL-PC**.

An applicant for educational evaluation who satisfies all the criteria for candidate registration is automatically registered as a candidate in that category. An applicant for educational evaluation who satisfies all criteria for professional registration in a category may apply for registration in that category providing that assessment against the following criteria may be

#### CONTROLLED DISCLOSURE

<b>Document No.:</b> E-17-PRO	<b>Revision No.:</b> 0	<b>Effective Date:</b> 14/02/2023	
<b>Subject: Criteria and Processes for Recognition of Educational Qualifications and Individual Assessment for Professional Categories</b>			
<b>Compiled by:</b> Assistant Manager	<b>Approved by:</b> Manager	<b>Next Review Date:</b> 14/02/2027	Page 13 of 35
<b>Date:</b> 08/12/2022	<b>Date:</b> 12/12/2022		

deferred to the assessment of professional competence when applying for professional registration in the relevant category.

- In the case of an applicant for Candidate and Professional Engineering Engineer, criteria 7 and 8 in Table 1 apply.
- In the case of an applicant for Candidate and Professional Engineering Technologist, criteria 7 and 8 in Table 2 apply.
- In the case of an applicant for Candidate and Professional Engineering Technician, criteria 7 and 8 in Table 3 apply.


Applicants retain the credits for criteria that have been satisfied in a particular category for 3 years after the date of notification for recognition of one or more credits that was notified to the applicant.

To obtain recognition in a category, an applicant for educational evaluation may undertake further learning and assessment to satisfy the outstanding criteria. Such an applicant must submit a proposal for the form of learning and assessment to be undertaken for approval.

The following mechanisms may be applied for qualification evaluation as appropriate to individual cases:

- (a) A verification procedure is available to evaluate a fully documented qualification that is listed for accelerated processing and the quality of which is known to the ECSA. For this procedure, the applicant is required to supply only certified copies of the qualification certificates and academic transcripts. The evaluation process verifies that the qualification is of the listed type and that the subjects completed are consistent with an engineering qualification. Such qualifications would normally be accredited by a body that is not a signatory to one of the above accords and would normally originate from an education system or institution known to the ECSA as having substantially equivalent standards.
- (b) A fully documented qualification that does not conform to a listed known type may also be considered for substantial equivalence according to the criteria listed in the applicable Tables 1, 2 or 3. In this case, the applicant must provide all the information listed in Appendix A.

**CONTROLLED DISCLOSURE**

<b>Document No.:</b> E-17-PRO	<b>Revision No.:</b> 0	<b>Effective Date:</b> 14/02/2023	
<b>Subject: Criteria and Processes for Recognition of Educational Qualifications and Individual Assessment for Professional Categories</b>			
<b>Compiled by:</b> Assistant Manager	<b>Approved by:</b> Manager	<b>Next Review Date:</b> 14/02/2027	Page 14 of 35
<b>Date:</b> 08/12/2022	<b>Date:</b> 12/12/2022		

Qualification-evaluation mechanisms indicated in (a) and (b) above are normally applied first before invoking the IA mechanisms mentioned in 4.2 below.

## 4.2 Process and criteria for method iv

### 4.2.1 Mechanisms for assessment

The following mechanisms may be applied for appropriate assessment of individual cases:

- (a) Written examinations prescribed by the ECSA to assess the fundamentals of the discipline relevant to the category with embedded assessment of mathematics and the underpinning natural sciences.
- (b) A written essay-type examination prescribed by the ECSA on social, environmental, professional and ethical issues together with the integral assessment of written communication ability relevant to the category.
- (c) Examinations at the exit level of accredited qualifications set by higher education providers or professional examining bodies in engineering specialist areas.
- (d) Oral examination provided that this is not the sole mechanism used.
- (e) Assessment of evidence presented by the applicant of prior learning against the appropriate criteria indicated in Tables 1, 2 or 3.
- (f) Evidence of work experience against the appropriate criteria indicated in Tables 1, 2 or 3.

### 4.2.2 Additional requirements

Applicants proceeding under methods (iii) or (iv) may be interviewed to gain additional information regarding the qualification. This form of interview is not an examination.


Evaluation of an applicant's qualification and the individual evaluation of an applicant's educational standing by the ECSA is an advisory service.

Applications must be submitted in English, and all interviews and assessments will be conducted in English.

An applicant whose educational achievement is found to be deficient against particular criteria may, within 30 days of notification, submit further evidence for a review of the evaluation.

#### **CONTROLLED DISCLOSURE**


When downloaded for the ECSA Document Management System, this document is uncontrolled and the responsibility rest with the user to ensure that it is in line with the authorized version on the ECSA Document Management System.  
QM-TEM-001 Rev 1 – ECSA Policy/Procedure

<b>Document No.:</b> E-17-PRO	<b>Revision No.:</b> 0	<b>Effective Date:</b> 14/02/2023	
<b>Subject: Criteria and Processes for Recognition of Educational Qualifications and Individual Assessment for Professional Categories</b>			
<b>Compiled by:</b> Assistant Manager	<b>Approved by:</b> Manager	<b>Next Review Date:</b> 14/02/2027	Page 15 of 35
<b>Date:</b> 08/12/2022	<b>Date:</b> 12/12/2022		

**Table 1: Criteria for substantial equivalence for the Candidate and Professional Engineer**

	<b>Qualifications evaluation criteria</b>	<b>Individual assessment criteria</b>	<b>Method of assessment</b>	
1.1	The programme covers the fundamentals of mathematics and the natural sciences appropriate to the discipline. The programme contains the equivalent of at least one semester of mathematical sciences and one semester of natural sciences.	The applicant displays an understanding of and the ability to apply the fundamentals of engineering in a selected discipline together with the underpinning fundamentals of mathematics and the natural sciences.	Complete Fundamentals Examinations (Engineer Level as specified in Section 7.1)	If experienced, complete Engineering Principles examination (Engineer Level) (See Section 7.1)
1.2	The programme adequately covers the engineering fundamentals appropriate to the discipline.			
1.3	The programme contains engineering studies related to current practice in the selected field.	The applicant displays proficiency in engineering specialist fields at the exit level.	a) Complete approved exit-level courses at educational institutions that offer accredited BEng-type programmes as specified in Section 7.3 (prerequisite courses may be required by the university) or b) Complete approved examinations set by other bodies	
2	The level of problem-solving demanded at the exit level corresponds to complex engineering problems defined in ECSA document <b>E-02-PE</b> .			
3	The programme contains a selection of engineering tools and IT support appropriate to the discipline.	The applicant displays proficiency in the use of engineering tools and IT support appropriate to the discipline.		
4	The curriculum has the requirement for a major design exercise. The design problem meets the requirements of a <i>complex engineering problem, and the</i>	The applicant demonstrates design proficiency through substantial project work. The design problem meets the requirements of a <i>complex engineering problem, and the</i>	a) Complete a final year design project at an educational institution with accredited BEng programme(s) in the discipline or	

**CONTROLLED DISCLOSURE**


<b>Document No.:</b> E-17-PRO	<b>Revision No.:</b> 0	<b>Effective Date:</b> 14/02/2023	
<b>Subject: Criteria and Processes for Recognition of Educational Qualifications and Individual Assessment for Professional Categories</b>			
<b>Compiled by:</b> Assistant Manager	<b>Approved by:</b> Manager	<b>Next Review Date:</b> 14/02/2027	Page 16 of 35
<b>Date:</b> 08/12/2022	<b>Date:</b> 12/12/2022		

	<b>Qualifications evaluation criteria</b>	<b>Individual assessment criteria</b>	<b>Method of assessment</b>
	<i>design approach is properly structured.</i>	<i>design approach is properly structured.</i>	b) Submit a design portfolio based on work by applicant (See Section 7.4)
5	The curriculum requires experimental work and research methodology.	The applicant demonstrates proficiency in experimental and research methodology.	a) Complete a final-year laboratory project at an educational institution with accredited BEng programmes in the discipline or b) Submit a report based on research/ investigative work done by applicant or c) Submit relevant research in a higher degree (See Section 7.5)
6	The curriculum requires oral and written communication at the level expected of a graduate.	The applicant communicates in writing at the exit level of a BEng programme.	Satisfactory assessment against criteria 4, 5, 7 and 8.
7	The curriculum contains elements that give an understanding of the impact of engineering activity.	The applicant explains and analyses the impacts of engineering activity.	Provide a portfolio of evidence that demonstrates this competence or defer to the registration stage (Engineer Level) (See Section 7.5).
8	The curriculum contains elements that give an understanding of ethics and engineering professionalism.	The applicant explains ethical principles and analyses ethical issues.	

**CONTROLLED DISCLOSURE**

When downloaded for the ECSA Document Management System, this document is uncontrolled and the responsibility rest with the user to ensure that it is in line with the authorized version on the ECSA Document Management System.  
QM-TEM-001 Rev 1 – ECSA Policy/Procedure




<b>Document No.:</b> E-17-PRO	<b>Revision No.:</b> 0	<b>Effective Date:</b> 14/02/2023	
<b>Subject: Criteria and Processes for Recognition of Educational Qualifications and Individual Assessment for Professional Categories</b>			
<b>Compiled by:</b> Assistant Manager	<b>Approved by:</b> Manager	<b>Next Review Date:</b> 14/02/2027	Page 17 of 35
<b>Date:</b> 08/12/2022	<b>Date:</b> 12/12/2022		

**Table 2: Criteria for substantial equivalence for the Candidate and Professional Engineering Technologist**

	<b>Qualifications evaluation criteria</b>	<b>Individual assessment criteria</b>	<b>Method of assessment</b>	
1.1	The programme has a foundation of mathematics, and the natural sciences appropriate to an engineering discipline with the equivalent of at least three quarters of a semester of mathematical sciences and one half of a semester of natural sciences.	The applicant displays an understanding of and the ability to apply the fundamentals of engineering in a selected sub discipline together with the underpinning fundamentals of mathematics and the natural sciences.	Complete Fundamentals Examinations (Technologist Level as specified in Section 7.1)	If experienced, complete Engineering Principles examinations (Technologist Level) (See Section 7.3).
1.2	The programme adequately covers the engineering fundamentals appropriate to the discipline.			
1.3	The programme contains studies of the engineering technologies relevant to the discipline.	The applicant displays proficiency in engineering specialist fields of a selected engineering discipline at the exit level.	a) Complete approved exit-level courses at educational institutions that offer accredited BTech-type programmes (prerequisite courses may be required by the educational institution) or	
2.	The level of problem-solving demanded at the exit level corresponds to <i>broadly defined engineering problems</i> (defined in ECSA documents <b>E-02-PT</b> , and <b>E-09-PT</b> ).			
3	The programme contains a selection of engineering tools and IT support appropriate to the discipline.	The applicant displays proficiency in the use of engineering tools and IT support appropriate to the discipline.	b) Complete approved examinations set by other bodies (See Section 7.2)	
4	Design proficiency is demonstrated through substantial project work. The design problem meets the requirements of a <i>broadly</i>	The applicant demonstrates design proficiency through substantial project work. The design problem meets	a) Complete a final-year design project at an educational institution with accredited BTech/BEng Tech programme(s) in the discipline.	

**CONTROLLED DISCLOSURE**


When downloaded for the ECSA Document Management System, this document is uncontrolled and the responsibility rest with the user to ensure that it is in line with the authorized version on the ECSA Document Management System.  
QM-TEM-001 Rev 1 – ECSA Policy/Procedure

<b>Document No.:</b> E-17-PRO	<b>Revision No.:</b> 0	<b>Effective Date:</b> 14/02/2023	
<b>Subject: Criteria and Processes for Recognition of Educational Qualifications and Individual Assessment for Professional Categories</b>			
<b>Compiled by:</b> Assistant Manager	<b>Approved by:</b> Manager	<b>Next Review Date:</b> 14/02/2027	Page 18 of 35
<b>Date:</b> 08/12/2022	<b>Date:</b> 12/12/2022		

	<b>Qualifications evaluation criteria</b>	<b>Individual assessment criteria</b>	<b>Method of assessment</b>
	<i>defined engineering problem, and the design approach is properly structured.</i>	the requirements of a <i>broadly defined engineering problem, and the design approach is properly structured.</i>	b) Submit a design portfolio based on work by applicant (See Section 7.4).
5	The programme contains experimental or investigative work and information-handling methodology.	The applicant demonstrates proficiency in experimental or investigative and information-handling methodology.	a) Complete a final-year laboratory project at an educational institution with accredited BTech/BEng Tech programmes in the discipline <i>or</i> b) Submit a report based on research/ investigative work done by applicant <i>or</i> c) Submit relevant research in a higher degree (See Section 7.5).
6	The curriculum requires oral and written communication at the level expected of a technology graduate.	The applicant communicates in writing at the exit level of a BTech/ BEng Tech / Adv Dip / BEng Tech (Hons) programme.	Criterion 6 may be satisfied by the report(s) submitted against criteria 4, 5, 7 or 8.
7	The curriculum contains elements that give an understanding of the impact of the engineering technologies of the discipline.	The applicant explains and analyses the impacts of engineering technologies of the discipline.	Portfolio of evidence that demonstrates this competence or defer to the registration stage (Technologist Level) (See Section 7.5).
8	The curriculum contains elements that give an understanding of ethics and engineering professionalism.	The applicant explains ethical principles and analyses ethical issues.	

**CONTROLLED DISCLOSURE**

When downloaded for the ECSA Document Management System, this document is uncontrolled and the responsibility rest with the user to ensure that it is in line with the authorized version on the ECSA Document Management System.  
QM-TEM-001 Rev 1 – ECSA Policy/Procedure


<b>Document No.:</b> E-17-PRO	<b>Revision No.:</b> 0	<b>Effective Date:</b> 14/02/2023	
<b>Subject: Criteria and Processes for Recognition of Educational Qualifications and Individual Assessment for Professional Categories</b>			
<b>Compiled by:</b> Assistant Manager	<b>Approved by:</b> Manager	<b>Next Review Date:</b> 14/02/2027	Page 19 of 35
<b>Date:</b> 08/12/2022	<b>Date:</b> 12/12/2022		

**Table 3: Criteria for substantial equivalence for the Candidate and Professional Engineering Technician**

	<b>Qualifications Evaluation Criteria</b>	<b>Individual Assessment Criteria</b>	<b>Method of Assessment</b>	
1.1	The programme covers the fundamentals of mathematics, and the natural sciences appropriate to a discipline with at least the equivalent of one half of a semester of mathematical sciences and one third of a semester of natural sciences.	The applicant displays an understanding of and the ability to apply a coherent range of discipline-specific fundamental principles in engineering science and technology supported by established mathematical formulas to solve <i>well-defined engineering problems</i> .	Complete Fundamentals Examinations (Technician Level) (See Section 7.1)	If experienced, complete Engineering Principles examinations (Technician Level) (See Section 7.3).
1.2	The programme adequately covers the engineering fundamentals appropriate to the discipline.			
1.3	The programme contains studies of the engineering technologies relevant to the discipline.	The applicant displays proficiency in discipline-specific engineering techniques at exit level.	a) Complete approved exit-level courses at educational institutions that offer accredited ND-type programmes (prerequisite courses may be required by the educational institution) <i>or</i>	
2	The level of problem-solving demand at the exit level corresponds to well-defined engineering problems (defined in ECSA document <b>E-02-PN</b> ).			
3	The programme contains a selection of engineering tools and IT support appropriate to the discipline.	The applicant displays proficiency in the use of engineering tools and IT support appropriate to the discipline for the solution of <i>well-defined engineering problems</i> .	b) Complete approved examinations set by other bodies (See Section 7.2).	
4	Design proficiency is demonstrated through project work. The design problem meets the requirements of a	The applicant demonstrates procedural design proficiency through project work. The design problem	a) Complete a final-year design project at an educational	

**CONTROLLED DISCLOSURE**

When downloaded for the ECSA Document Management System, this document is uncontrolled and the responsibility rest with the user to ensure that it is in line with the authorized version on the ECSA Document Management System.  
QM-TEM-001 Rev 1 – ECSA Policy/Procedure

<b>Document No.:</b> E-17-PRO	<b>Revision No.:</b> 0	<b>Effective Date:</b> 14/02/2023	
<b>Subject: Criteria and Processes for Recognition of Educational Qualifications and Individual Assessment for Professional Categories</b>			
<b>Compiled by:</b> Assistant Manager	<b>Approved by:</b> Manager	<b>Next Review Date:</b> 14/02/2027	Page 20 of 35
<b>Date:</b> 08/12/2022	<b>Date:</b> 12/12/2022		


	<b>Qualifications Evaluation Criteria</b>	<b>Individual Assessment Criteria</b>	<b>Method of Assessment</b>
	well-defined engineering problem, and the design approach is properly structured.	meets the requirements of a well-defined engineering problem, and the design approach is properly structured.	institution with accredited NDip programme(s) in the discipline. b) Submit a design portfolio based on applicant's own work (See Section 7.4).
5	Proficiency in experimental procedures and data-handling methodology is demonstrated.	The applicant demonstrates proficiency in standardised experimental and research methodology.	a) Complete a final-year laboratory project at an educational institution with accredited ND programmes in the discipline <i>or</i> b) Submit a report based on investigative work/field work done by applicant <i>or</i> c) Submit relevant research in a higher degree (See Section 7.5).
6	The curriculum requires oral and written communication using prescribed formats.	The applicant communicates in writing at the exit level of an NDip, a Diploma in Engineering,	Criterion 6 may be satisfied by the report(s) submitted against criteria 4, 5, 7 or 8.
7	The curriculum contains elements that give an understanding of the impact of the engineering procedures of the discipline.	The applicant explains and analyses the impacts of engineering activity and addresses issues by defined procedures.	Portfolio of evidence that demonstrates this competence or defer to the registration stage (Technician Level) (See Section 7.5).
8	The curriculum contains elements that give an understanding of ethics and engineering professionalism.	The applicant understands and commits to professional ethical principles in engineering.	

## 5. APPLICANTS WHO DO NOT MEET REQUIREMENTS

In the case of applicants who do not meet the requirements, the general practice is to inform the applicants that they have not met the educational requirements, listing the criteria that were not satisfied. Applicants may subsequently take remedial action and return for evaluation. In general, applications will not be refused outright; only in rare cases will a decision of no recognition possible be returned.

### CONTROLLED DISCLOSURE

When downloaded for the ECSA Document Management System, this document is uncontrolled and the responsibility rest with the user to ensure that it is in line with the authorized version on the ECSA Document Management System.  
QM-TEM-001 Rev 1 – ECSA Policy/Procedure

<b>Document No.:</b> E-17-PRO	<b>Revision No.:</b> 0	<b>Effective Date:</b> 14/02/2023	
<b>Subject: Criteria and Processes for Recognition of Educational Qualifications and Individual Assessment for Professional Categories</b>			
<b>Compiled by:</b> Assistant Manager	<b>Approved by:</b> Manager	<b>Next Review Date:</b> 14/02/2027	Page 21 of 35
<b>Date:</b> 08/12/2022	<b>Date:</b> 12/12/2022		

## 6. COMPOSITION OF INTERVIEW AND ORAL EXAMINATION PANEL

An interview in terms of Section 4.2.2 or an oral examination in terms of Section 4.2.1(d) must be conducted by at least two academics who are currently active in conducting accredited programmes that are in or related to the discipline of the applicant and one practitioner who is registered in a relevant category.

## 7. FORMS OF ASSESSMENT

The individual assessment criteria and the permitted methods of assessment for each category are listed in the following tables:

- Table 1: Candidate and Professional Engineer categories
- Table 2: Candidate and Professional Engineering Technologist categories
- Table 3: Candidate and Professional Engineering Technician categories.


Criteria 1.1 to 8 for each of the above categories of registration are listed in Tables 1, 2 and 3 respectively.

### 7.1 Satisfying Criteria 1.1 And 1.2 by completing approved fundamental courses at an educational institution

Criteria 1.1 and 1.2 may be satisfied by completing examinations for approved fundamental courses/modules at an educational institution that offers accredited programmes in the relevant discipline or sub-discipline for the category of registration. This may be with or without attendance at the relevant courses depending on the rules of the individual educational provider.

An applicant may also propose examinations offered by engineering professional bodies or other approved education institutions in lieu of courses offered by an accredited educational provider.

#### **CONTROLLED DISCLOSURE**


<b>Document No.:</b> E-17-PRO	<b>Revision No.:</b> 0	<b>Effective Date:</b> 14/02/2023	
<b>Subject: Criteria and Processes for Recognition of Educational Qualifications and Individual Assessment for Professional Categories</b>			
<b>Compiled by:</b> Assistant Manager	<b>Approved by:</b> Manager	<b>Next Review Date:</b> 14/02/2027	Page 22 of 35
<b>Date:</b> 08/12/2022	<b>Date:</b> 12/12/2022		

## 7.2 Satisfying Criteria 1.3 and 2 by completing approved exit-level courses at an educational institution

Criteria 1.3 and 2 may be satisfied by completing examinations for approved exit-level courses/modules at an educational institution that offers accredited programmes in the relevant discipline or sub-discipline for the category of registration. This may be with or without attendance at the relevant courses depending on the rules of the individual educational provider.

- An applicant for this form of assessment must initially have credit for criteria 1.1 and 1.2 of the intended category of registration.
- The applicant must submit a suite of exit-level courses that provides advanced and specialist study relating to the category and that requires the use of engineering methods and tools for approval by the Qualification Evaluation Working Group (QEWG) or an Engineering Educational Provider that has accredited Engineering Educational Programmes.
- Proposed courses must be within the curriculum of an accredited programme and have a total number of South African Qualification Authority (SAQA) credits that is not less than the required credits for the advanced and specialist courses. These credits are calculated according to the method stipulated in document **E-01-POL-PC**.
- An applicant may also propose examinations offered by engineering professional bodies in lieu of educational provider courses. Such examinations must be at the exit level of an accredited degree and must meet the requirements of advanced and specialist study and demonstrate the use of engineering methods.
- On submission of certification of completing the full set of successful examinations, credit will be given for criteria 2.3 and 2.
- An applicant who wishes to change examinations in the approved set must apply in advance to the QEWG for permission to make the change.

### CONTROLLED DISCLOSURE

<b>Document No.:</b> E-17-PRO	<b>Revision No.:</b> 0	<b>Effective Date:</b> 14/02/2023	
<b>Subject: Criteria and Processes for Recognition of Educational Qualifications and Individual Assessment for Professional Categories</b>			
<b>Compiled by:</b> Assistant Manager	<b>Approved by:</b> Manager	<b>Next Review Date:</b> 14/02/2027	Page 23 of 35
<b>Date:</b> 08/12/2022	<b>Date:</b> 12/12/2022		

### **7.3 Satisfying engineering fundamentals and discipline-specific examinations (Criteria 1, 2 and 3)**

An applicant who has at least 3 years' practical experience at the level required for registration in a category may submit a portfolio of such engineering work to the QEWG for assessment. This submission must be accompanied by an integrative report indicating the engineering science basis for the work.

If the QEWG is satisfied that the portfolio and report provide a suitable basis, the applicant may then apply to an educational provider. Upon acceptance, the educational provider presents the required accredited qualifications to the applicant to undertake the necessary examinations to meet criteria 1, 2 and 3. This includes the final-year project (capstone project) with or without attendance, depending on the rules of the individual education provider.

- An applicant must have satisfied criteria 1.1 and 1.2 before undertaking criteria 1.3, 2 and 3.
- An applicant satisfying 5.3 and 1.3, 2 and 3 will be granted credit for criteria 1, 2 and 3.

### **7.4 Satisfying the design requirement (Criteria 4 and 6)**


An applicant intending to satisfy Criterion 4 may apply to the QEWG for approval to either:

- complete an exit-level (final) design project at an educational provider with accredited programme(s) in the discipline or sub-discipline with or without attendance at the relevant course; or
- submit a design portfolio and an integrative report based on the applicant's own work for assessments.

In the case of (a) above, on submission of certification of passing the exit-level design project by the educational institution, the QEWG will grant credit for Criterion 4.

An applicant wishing to proceed according to (b) above must apply to the QEWG for permission to proceed by this route. Such an applicant must have credit for criteria 1, 2 and 3.

#### **CONTROLLED DISCLOSURE**

<b>Document No.:</b> E-17-PRO	<b>Revision No.:</b> 0	<b>Effective Date:</b> 14/02/2023	
<b>Subject: Criteria and Processes for Recognition of Educational Qualifications and Individual Assessment for Professional Categories</b>			
<b>Compiled by:</b> Assistant Manager	<b>Approved by:</b> Manager	<b>Next Review Date:</b> 14/02/2027	Page 24 of 35
<b>Date:</b> 08/12/2022	<b>Date:</b> 12/12/2022		

In the case of a portfolio submitted in terms of (b) above, the QEWG must appoint two examiners to assess the design report and portfolio against Criterion 4. The assessment must include an oral examination component. The examiners must recommend to the QEWG whether credit should be given for Criterion 4.

An applicant may in the course of the written project and oral examination provide evidence of compliance with Criterion 6

### **7.5 Satisfying the experimental requirement (Criterion 5)**

An applicant intending to satisfy Criterion 5 may apply to the QEWG for approval regarding the relevant category.

#### **7.5.1 Professional or Candidate Engineer**

If the intended category is Professional or Candidate Engineer, they must:

- (a) complete an exit-level laboratory project at a university with accredited BEng programmes in the discipline;
- (b) submit a report based on research/investigative work done by the applicant that reflects work at a level comparable with the exit level of an accredited programme; or
- (c) submit relevant research in a completed higher degree.


#### **7.5.2 Professional or Candidate Engineering Technologist**

If the intended category is Professional or Candidate Engineering Technologist, they must:

- (a) submit a report based on research/investigative work done by the applicant that reflects work at a level comparable with the exit level of an accredited programme; or
- (b) submit relevant research in a completed higher degree.

#### **CONTROLLED DISCLOSURE**



<b>Document No.:</b> E-17-PRO	<b>Revision No.:</b> 0	<b>Effective Date:</b> 14/02/2023	
<b>Subject: Criteria and Processes for Recognition of Educational Qualifications and Individual Assessment for Professional Categories</b>			
<b>Compiled by:</b> Assistant Manager	<b>Approved by:</b> Manager	<b>Next Review Date:</b> 14/02/2027	Page 25 of 35
<b>Date:</b> 08/12/2022	<b>Date:</b> 12/12/2022		

### 7.5.3 Professional or Candidate Engineering Technician

If the intended category is Professional or Candidate Engineering Technician, they must:

- (a) submit a report based on laboratory/field-testing work done by the applicant that reflects work at a level comparable with the exit level of an accredited programme; or
- (b) submit a report based on investigative work done by the applicant that reflects work at a level comparable with the exit level of an accredited programme; or
- (c) submit relevant research in a completed higher degree.


In regard to submissions in terms of 7.5.1, 7.5.2 or 7.5.3, the QEWG must appoint two examiners to assess the report against Criterion 5. In the case of a submission of completed higher degree dissertation or thesis, two evaluators must examine the relevant parts of the dissertation or thesis against Criterion 5. The assessment may include an oral examination component. The examiners must recommend to the QEWG whether credit should be given for Criterion 5.

This application must be accompanied by the prescribed fee.

### 7.6 Satisfying criteria 7 and 8

An applicant intending to satisfy the requirements for Candidate or Professional Registration may defer this to the registration stage or include this in the Portfolio of Engineering Work.

#### **CONTROLLED DISCLOSURE**

<b>Document No.:</b> E-17-PRO	<b>Revision No.:</b> 0	<b>Effective Date:</b> 14/02/2023	
<b>Subject: Criteria and Processes for Recognition of Educational Qualifications and Individual Assessment for Professional Categories</b>			
<b>Compiled by:</b> Assistant Manager	<b>Approved by:</b> Manager	<b>Next Review Date:</b> 14/02/2027	Page 26 of 35
<b>Date:</b> 08/12/2022	<b>Date:</b> 12/12/2022		

## 8. LIMITATIONS ON ASSESSMENT

The following limitations apply:


- A maximum of two knowledge areas will be considered for approval of sets of exit-level examinations under Section 4.
- A maximum of two knowledge areas will be considered for recognition of project examinations set by the educational institution or assessment by portfolio under sections 6 and 7.

**Table 4: Fundamental engineering sciences: Engineer Category**

Fundamental Engineering Science	Disciplines										
	Aero	Agr	Chem	Extr Met	Civ	Elec Power	Elec-tronic	Mech	Ind	Phys Met	Min
Engineering mechanics	X	X	X	X	X	X	X	X	X	X	X
Materials science	X			X	X			X	X	X	
Mechanics of solids	X	X			X			X	X	X	X
Theory of machines		X						X	X		
Theory of structures		X			X						
Fluid mechanics	X	X	X	X	X			X			X
Thermodynamics	X		X	X				X	X	X	X
Transport phenomena			X								
Chem. reaction kinetics			X	X							
Electric circuits						X	X				
Electromagnetics							X				
Electronics						X	X				
Computing and software							X				
Signals, systems and control						X	X				
Electrical machines and systems						X					
Discrete system analysis									X		X

### CONTROLLED DISCLOSURE

When downloaded for the ECSA Document Management System, this document is uncontrolled and the responsibility rest with the user to ensure that it is in line with the authorized version on the ECSA Document Management System.  
QM-TEM-001 Rev 1 – ECSA Policy/Procedure

Document No.: E-17-PRO	Revision No.: 0	Effective Date: 14/02/2023	
Subject: Criteria and Processes for Recognition of Educational Qualifications and Individual Assessment for Professional Categories			
Compiled by: Assistant Manager	Approved by: Manager	Next Review Date: 14/02/2027	Page 27 of 35
Date: 08/12/2022	Date: 12/12/2022		

## 9. ACCREDITED QUALIFICATIONS FOR REGISTRATION AS A CANDIDATE OR PROFESSIONAL IN ENGINEERING TECHNOLOGIST AND ENGINEERING TECHNICIAN CATEGORIES

The suite of qualifications for registration in the categories mentioned above is listed in this document **E-17-PRO**.

These qualifications may be taken as full-time and/or part-time courses, depending on the rules of the individual education provider.

## 10. ALTERNATIVE ROUTE FOR QUALIFICATION/ASSESSMENT FOR REGISTRATION AS PROFESSIONAL TECHNOLOGIST AND/OR PROFESSIONAL TECHNICIAN

These alternative route qualifications do not apply for registration as a candidate.

All qualifications listed in Table 5 below require an extended period of engineering experience and responsible engineering experience except where qualifications are substantially equivalent to the present benchmark qualifications.


In conjunction with engineering and responsible engineering, alternative route qualifications are required to be at the *broadly defined level of problem-solving* or at the *well-defined level of problem solving* for *Technologists* and *Technicians* respectively.

The benchmark qualifications for registration of Technologists and Technicians must demonstrate exit-level problem-solving at NQF level 6 and NQF level 7 respectively.

Alternative route qualifications awarded prior to 1971 and up to 2018 are presented in Table 5.

### CONTROLLED DISCLOSURE

When downloaded for the ECSA Document Management System, this document is uncontrolled and the responsibility rest with the user to ensure that it is in line with the authorized version on the ECSA Document Management System.  
QM-TEM-001 Rev 1 – ECSA Policy/Procedure


<b>Document No.:</b> E-17-PRO	<b>Revision No.:</b> 0	<b>Effective Date:</b> 14/02/2023	
<b>Subject: Criteria and Processes for Recognition of Educational Qualifications and Individual Assessment for Professional Categories</b>			
<b>Compiled by:</b> Assistant Manager	<b>Approved by:</b> Manager	<b>Next Review Date:</b> 14/02/2027	Page 28 of 35
<b>Date:</b> 08/12/2022	<b>Date:</b> 12/12/2022		

**Table 5: Recognition of alternative route qualifications**

Qualification	Type	Equivalence Reference	Technician Index		Technology index	
			a	b	c	d
Sen Certificate	1	01/02	09	01	20	10
NTC 11, NTC3, N3 CERT	2	02/03	09	01	20	10
ATC 1, N4 CERT	2	04	09	01	14	10
ATC11, N5 CERT	2	05	06	01	13	09
NED, NTD	2	06/17	06	01	10	07
Certificate of Competency	2	07	08	01	13	09
Nat Dip Tech (4y), NDT	3	08	03	01	06	04
T1 Cert, N4 Cert	3/2	20/15	08	01	14	1
T2 Cert	3	21	06	01	12	08
Intermediate Dip, N6 Cert	3	22	06	01	11	08
Nat Cert for Techni, NnD	3/2	23	06	01	10	06
NCT Telecom	3	24	06	01	10	06
NCT Telecom-Elec	3	25	06	01	10	06
NHCT	3	26	06	01	09	05
ND Techni (NDT)(HND)(4y)	3	27	03	01	06	04
NHDT (Tele, Elect, Mech)	3	28	03	01	05	03
Adv Dip for Techni (Tele)	3	29	03	01	03	01
Nat Dip (N Dip)	3	40	03	01	08	05
Nat Higher Diploma (NHD)	3	41	03	01	06	04
Nat Dip Techno (N Dip Tech)	3	42	03	01	03	01
Master Dip Techno (MDT)	3	43	03	01	03	01
Nat Laureates in Technology	3	44	03	01	03	01
Bachelor of Technology (BTech)	3	45	03	01	03	01
Master's degree in Technology (MTech)	3				03	
BSc/BEng	4	51	04	01	04	01

**CONTROLLED DISCLOSURE**

When downloaded for the ECSA Document Management System, this document is uncontrolled and the responsibility rest with the user to ensure that it is in line with the authorized version on the ECSA Document Management System.  
QM-TEM-001 Rev 1 – ECSA Policy/Procedure

<b>Document No.:</b> <b>E-17-PRO</b>	<b>Revision No.: 0</b>	<b>Effective Date:</b> <b>14/02/2023</b>	
<b>Subject: Criteria and Processes for Recognition of Educational Qualifications and Individual Assessment for Professional Categories</b>			
<b>Compiled by:</b> <b>Assistant Manager</b>	<b>Approved by:</b> <b>Manager</b>	<b>Next Review Date:</b> <b>14/02/2027</b>	Page 29 of 35
<b>Date: 08/12/2022</b>	<b>Date: 12/12/2022</b>		

#### **Details for Table 5: Codes and indices registration index**

- a = years of acceptable engineering experience
- b = years of acceptable responsible engineering experience included in 'a' above
- c = years of acceptable engineering experience
- d = years of acceptable responsible experience included in 'c' above.

#### **Type:**

1. School
2. Technical college and TVET college
3. University of technology and technology qualifications at comprehensive university
4. University and engineering qualifications at comprehensive university

### **11. FOREIGN NON-ACCREDITED QUALIFICATIONS QUALIFICATION ASSESSMENTS**


All non-accredited qualification assessments other than those stated in this document **E-17-PRO** are assessed on an individual basis and normally require an interview.

### **12. APPEALS**

Document **E-16-PRO** defines the procedure to be followed to appeal a decision of the Education Committee.

#### **CONTROLLED DISCLOSURE**

When downloaded for the ECSA Document Management System, this document is uncontrolled and the responsibility rest with the user to ensure that it is in line with the authorized version on the ECSA Document Management System.  
QM-TEM-001 Rev 1 – ECSA Policy/Procedure

<b>Document No.:</b> E-17-PRO	<b>Revision No.:</b> 0	<b>Effective Date:</b> 14/02/2023	
<b>Subject: Criteria and Processes for Recognition of Educational Qualifications and Individual Assessment for Professional Categories</b>			
<b>Compiled by:</b> Assistant Manager	<b>Approved by:</b> Manager	<b>Next Review Date:</b> 14/02/2027	Page 30 of 35
<b>Date:</b> 08/12/2022	<b>Date:</b> 12/12/2022		

## REVISION HISTORY

Revision number	Revision date	Revision details	Approved by
Rev. 0 Draft A	08 Dec 2022	Merging E-17-PRO and E-18-PRO into one combined document E-17-PRO	RDDR Business Unit
Rev. 0 Draft B	12 Dec 2022	Draft combined document E-17-PRO	RDDR Business Unit
Rev. 0 Draft C	25 Jan 2023	Draft sent to Education and Registration for comments and inputs	RDDR BU, Education BU and Registration BU.
Rev. 0 Draft D	02 Jan 2023	Review and Recommendation for Approval	RPS Executive
Rev 0	14 Feb 2023	Approval	RPSC

Criteria and Processes for:

### Recognition of Educational Qualifications for Professional Categories

Revision 0 dated 14 February 2023 consisting of 29 pages have been reviewed for adequacy by the Business Unit Assistant Manager and is approved by the Acting Executive: Research, Policy and Standards (RPS).

  
.....

Business Unit Manager

14 April 2023  
.....

Date

  
.....

Executive: RPS


2023/04/14  
.....

Date

This definitive version of this policy is available on our website

#### CONTROLLED DISCLOSURE

When downloaded for the ECSA Document Management System, this document is uncontrolled and the responsibility rest with the user to ensure that it is in line with the authorized version on the ECSA Document Management System.  
QM-TEM-001 Rev 1 – ECSA Policy/Procedure

<b>Document No.:</b> E-17-PRO	<b>Revision No.:</b> 0	<b>Effective Date:</b> 14/02/2023	
<b>Subject: Criteria and Processes for Recognition of Educational Qualifications and Individual Assessment for Professional Categories</b>			
<b>Compiled by:</b> Assistant Manager	<b>Approved by:</b> Manager	<b>Next Review Date:</b> 14/02/2027	Page 31 of 35
<b>Date:</b> 08/12/2022	<b>Date:</b> 12/12/2022		


## **Appendix A: Information for applicants regarding evaluation of qualifications, individual evaluation and proceeding by methods (iii) or (iv)**

A person proceeding by the qualification-evaluation route using methods (iii) or (iv) must provide, at minimum, the following evidence of educational achievement:

- Certified copies of all qualifications
- Full academic transcripts of all qualifications
- If the type of programme does not appear on the list of programmes for which graduates are eligible for consideration under case (iii), the following material must be supplied:
  - A curriculum analysis using the worksheet provided with as much detail as possible for each qualification
  - Details as to how the credits are calculated/allocated
  - Syllabi of the subjects studied
  - All Project Reports
  - Design Reports
  - Final Year / Capstone Project and dissertations for postgraduate qualifications.

### **CONTROLLED DISCLOSURE**

When downloaded for the ECSA Document Management System, this document is uncontrolled and the responsibility rest with the user to ensure that it is in line with the authorized version on the ECSA Document Management System.

<b>Document No.:</b> E-17-PRO	<b>Revision No.:</b> 0	<b>Effective Date:</b> 14/02/2023	
<b>Subject: Criteria and Processes for Recognition of Educational Qualifications and Individual Assessment for Professional Categories</b>			
<b>Compiled by:</b> Assistant Manager	<b>Approved by:</b> Manager	<b>Next Review Date:</b> 14/02/2027	Page 32 of 35
<b>Date:</b> 08/12/2022	<b>Date:</b> 12/12/2022		


## Appendix B: Syllabus for fundamental engineering sciences

### A.1: Engineer level

- **Topic EFE1: Engineering mechanics** – A vector geometric/algebraic approach to coplanar force systems, rigid body equilibrium, centre of mass, moment of inertia; a calculus-based formulation for applying the principles of Newtonian mechanics, work, energy, momentum (and the respective conservation laws), gravitation, friction; particle dynamics, oscillations, simple harmonic motion.
- **Topic EFE2: Mechanics of solids** – The behaviour of solid material under test and service conditions; analysis of elastic stress and strain, compression, tension, torsion.
- **Topic EFE3: Mechanics of structures** – Analysis of pin-jointed structures, bending, shear force and bending moment, buckling of struts, loading, forces on members and structures, statically indeterminate structures, composite materials, elastic and plastic analysis.
- **Topic EFE4: Mechanics of machines** – Torque and power in rotating mechanical systems, clutch analysis, belt and pulley transmissions, gearboxes, linkage mechanisms, velocity diagrams; kinematics and efficiency of gears and gear trains; balancing of rotating machines; crank-effort diagrams, balancing of reciprocating machinery; flywheels. links and joints making up mechanisms; kinematics and kinetics of mechanisms; design and analysis of cams, gears and drive trains; static and dynamic force analysis; synthesis of coupler curves; balancing of rotating and reciprocating masses.
- **Topic EFE5: Fluid mechanics** – Properties of fluids: density, viscosity, vapour pressure; fluid statics: pressure distribution, buoyancy; viscous flow: laminar flow, velocity profile, pipe flow, turbulent flow; fluid dynamics: equations of continuity, Euler and Bernoulli equations; hydraulics: pipe flow, turbulent flow; fluid momentum: linear and angular momentum, impulse, forces in pipes, propulsion, jets and turbines; fluid measurements.
- **Topic EFE6: Thermodynamics** – Thermal and mechanical energy transfer, the first Law of Thermodynamics: constant volume and constant pressure processes; the second Law of Thermodynamics: entropy, reversibility and irreversibility, enthalpy, thermodynamic cycles, thermodynamic efficiency.


#### CONTROLLED DISCLOSURE



<b>Document No.:</b> E-17-PRO	<b>Revision No.:</b> 0	<b>Effective Date:</b> 14/02/2023	
<b>Subject: Criteria and Processes for Recognition of Educational Qualifications and Individual Assessment for Professional Categories</b>			
<b>Compiled by:</b> Assistant Manager	<b>Approved by:</b> Manager	<b>Next Review Date:</b> 14/02/2027	Page 33 of 35
<b>Date:</b> 08/12/2022	<b>Date:</b> 12/12/2022		

- **Topic EFE7: Electric circuit analysis** – Ideal voltage and current sources, waveforms, average and root mean square values, instantaneous and average power, network topology, series and parallel resistors, voltage and current divider laws, star-delta transformations, systematic nodal and mesh circuit analysis, Superposition Theorem, real sources, Thevenin and Norton theorems, maximum power transfer, circuit behaviours of inductors and capacitors, transient and steady state sinusoidal analysis of RLC circuits, three-phase circuits.
- **Topic EFE8: Electromagnetics** – Maxwell’s equations for plane waves with conductor and dielectric boundary conditions; transmission lines with different length and matching conditions, standing waves, Smith Chart analysis; lumped component analysis of transmission lines.
- **Topic EFE9: Electrical machines and systems** – Analysis and design of magnetic circuits for machines and transformers; three phase AC systems, transmission lines, transformers, rectification, electric machines: DC, AC slip ring and squirrel cage, geometry, principles, analysis and performance.
- **Topic EFE10: Electronics** – Diode characteristics, rectifier circuits, small signal models; bipolar junction transistors: characteristics in relation to underlying physics, biasing, amplification, use as a switch; field-effect transistors: characteristics in relation to underlying physics, biasing, amplification, use as a switch; logic circuits: basic gates, combinational logic, sequential logic, logical analysis techniques; linear electronic circuit elements: single-ended, follower, differential pairs, current source; operational amplifier model and configurations: inverting, non-inverting, buffer, differential.
- **Topic EFE11: Materials science** – Categories of engineering materials, their structure and properties: metals, ceramics, polymers, composites; properties: mechanical (tensile, shear, creep, fatigue, fracture mechanics), electrical (conductivity in metals, semiconductors and insulators), magnetic (ferro-, dia- and para-magnetic), thermal (expansion, conductivity, heat capacity, radiation); optical (absorption, transmission, refraction).
- **Topic EFE12: Signals, systems and control** – Analysis of linear, time invariant systems using differential equations and Laplace Transform; steady-state sinusoidal analysis

**CONTROLLED DISCLOSURE**

<b>Document No.:</b> E-17-PRO	<b>Revision No.:</b> 0	<b>Effective Date:</b> 14/02/2023	
<b>Subject: Criteria and Processes for Recognition of Educational Qualifications and Individual Assessment for Professional Categories</b>			
<b>Compiled by:</b> Assistant Manager	<b>Approved by:</b> Manager	<b>Next Review Date:</b> 14/02/2027	Page 34 of 35
<b>Date:</b> 08/12/2022	<b>Date:</b> 12/12/2022		


using Fourier series and Fourier transform; analysis of systems with feedback, performance and stability.

- **Topic EFE12: Information, computing and software** – Basic data structures and algorithms; computer architecture; programming concepts: compiled and interpreted languages; programming paradigms: script (e.g., Matlab), object oriented (e.g., Java or C++), software development principles.
- **Topic EFE13: Discrete system analysis** – Discrete random systems; queueing systems theory; critical path analysis; quality and reliability principles; linear programming.
- **Topic EFE14: Transfer processes** – Momentum transfer; heat transfer by conduction, convection and radiation in typical situations; mass transfer operations in stagewise and continuous-contact equipment.
- **Topic EFE15: Chemical reaction kinetics** – Reaction stoichiometry, kinetics and thermodynamics; various types of reactors; kinetics of catalytic reactions; multi-reaction systems.

## A.2: Supporting Natural Sciences

- **Supporting Topic ESE1: Electricity and magnetism** – Electric charge, conductors and insulators, Coulomb's Law, conservation of charge, electric field, electric field and charge, Gauss' Law, electrical potential, potential and electric field, the capacitor, electric current, resistivity and resistance, Ohm's Law, energy transfer, Kirchoff's Voltage Law, Kirchoff's Current Law, magnetic field, force on a current, Ampere's Law, magnetic flux density, Faraday's Law, Lenz's Law, inductance.
- **Supporting Topic ESE2: Fluid mechanical principles** – Density, static pressure in a fluid, Pascal's Law, Archimedes' Principle, fluid dynamics, flow modes, streamlines and continuity, Bernoulli's Equation.
- **Supporting Topic ESE3: Heat, temperature** – Thermal equilibrium, temperature, thermometric materials, temperature scales, thermal expansion, heat and energy, specific head, thermal conduction, heat and work, First Law of Thermodynamics, gas laws, kinetic theory of gases.

### CONTROLLED DISCLOSURE

<b>Document No.:</b> E-17-PRO	<b>Revision No.:</b> 0	<b>Effective Date:</b> 14/02/2023	
<b>Subject: Criteria and Processes for Recognition of Educational Qualifications and Individual Assessment for Professional Categories</b>			
<b>Compiled by:</b> Assistant Manager	<b>Approved by:</b> Manager	<b>Next Review Date:</b> 14/02/2027	Page 35 of 35
<b>Date:</b> 08/12/2022	<b>Date:</b> 12/12/2022		

- **Supporting Topic ESE4: Quantum mechanics** – Quantum mechanical behaviours, the wave equation, potential wells and tunnelling, quantum mechanical model of the atom, the periodic table; models for semiconductor crystal lattices, electrons, holes, mobility, drift and diffusion currents, junctions and typical device structures.
- **Supporting Topic ESE5: Wave motion** – Classification of waves, travelling waves, energy transfer in a wave, superposition, interference, standing waves, damping, resonance.

**CONTROLLED DISCLOSURE**

When downloaded for the ECSA Document Management System, this document is uncontrolled and the responsibility rest with the user to ensure that it is in line with the authorized version on the ECSA Document Management System.  
QM-TEM-001 Rev 1 – ECSA Policy/Procedure