

Criteria for Accreditation of Engineering Programmes

E-03-CRI-P

REVISION No. 4: 15 October 2020



ENGINEERING COUNCIL OF SOUTH AFRICA

Tel: 011 6079500 | Fax: 011 6229295

Email: engineer@ecsa.co.za | Website: www.ecsa.co.za

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DEFINITIONS

Accreditation: Formal recognition awarded to an education or training programme through a quality assurance procedure that ensured the programme met the criteria laid down for the type of programme

Accreditation criteria: Statements of requirements that must be satisfied by a programme in order to receive accreditation

Assessment: The process of determining the capability or competence of an individual by evaluating performances against standards

Assessment criteria: A set of measurable performance requirements, which indicates that a person meets a specified outcome at the required level

Course: A building block of a programme with defined prerequisites, content and learning objectives with assessment, which if completed successfully provides credit towards a qualification

Critical: A factor, component, process, issue or decision in an engineering activity from which other consequences follow; an entity or operation that must be successfully implemented or completed to ensure that a more complex operation or system can function – failure of the critical entity or operation compromises the whole

Desktop Evaluation: A comprehensive electronic evaluation of an existing unaccredited programme that produces graduates; may be required as a precondition for an accreditation visit in the case of education providers who do not have programmes accredited by the ECSA but have completed one accreditation cycle

Dublin Accord: An international agreement for the mutual recognition of engineering programmes that provide the educational foundation for Professional Engineering Technicians

Education Committee: The committee established by Council to address all education matters

Engineering educational programme: An educational programme that aims to satisfy criteria prescribed by the ECSA

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Engineering sciences: Sciences that have roots in the mathematical and physical sciences and where applicable, in other natural sciences; sciences that extend knowledge and develop models and methods that lead to engineering applications and solve engineering problems

Evaluation: Determination of the compliance of a result with prescribed criteria based on documentation, inspection and the application of judgement supported by reasoning

External moderation: A moderation process in which the moderator(s) is not in the employ of the provider, has made no input into the programme and has no prior contact with the student

Graduate: A qualifying learner, irrespective of whether the qualification is a degree or a diploma

Graduate attribute: A statement of the learning outcomes that a student must demonstrate at the exit-level to qualify for the award of a qualification; these actions indicate the student's capability to fulfil the educational objectives

Initial Evaluation: An electronic evaluation of a proposed programme based on comprehensive planning information that is available to education providers who do not have programmes accredited by the ECSA for at least one cycle

International Engineering Alliance (IEA): A global organisation that comprises members from 41 jurisdictions within 29 countries across 7 international agreements. These international agreements govern the recognition of engineering educational qualifications and professional competence

Knowledge profile: The knowledge of a graduate in terms of the type and balance of knowledge in defined areas

Level: A measure of learning demands expressed in terms of level descriptors and encompassing types of problems, knowledge required, skills and responsibility

Moderation: The process of ensuring that the assessment of an individual meets the required standard and is consistent, objective and fair

Module: Synonymous with course

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Standards: Comprise statements of outcomes to be demonstrated and the levels of performance and content baseline requirements in the context of engineering educational programmes

Sydney Accord: An international agreement for the mutual recognition of engineering programmes that provide the educational foundation for Professional Engineering Technologists

Washington Accord: An international agreement for the mutual recognition of engineering programmes that provide the educational foundation for Professional Engineers

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ABBREVIATIONS

AC	Accreditation Committee
Adv Cert	Advanced Certificate
Adv Cert (EP)	Advanced Certificate in Engineering Practice
Adv Dip	Advanced Diploma
Adv Dip Eng	Advanced Diploma in Engineering
BEng	Bachelor of Engineering
BEng Tech	Bachelor of Engineering Technology
BEng Tech (Hons)	Bachelor of Engineering Technology Honours
BSc(Eng)	Bachelor of Science in Engineering
BTech	Bachelor of Technology
CHE	Council on Higher Education
DA	Dublin Accord
Dip	Diploma
Dip Eng	Diploma in Engineering
Dip Eng Tech	Diploma in Engineering Technology
EC	Education Committee
ECSA	Engineering Council of South Africa
GA	Graduate Attribute
HCert	Higher Certificate
HEQC	Higher Education Quality Committee
HEQSF	Higher Education Qualifications Sub-Framework
IEA	International Engineering Alliance
LMS	Learning Management System
MEng	Master of Engineering
ND	National Diploma
NQF	National Qualifications Framework
PGDip Eng Tech	Postgraduate Diploma in Engineering Technology
RPSC	Research, Policy and Standards Committee
SA	Sydney Accord
SADC	Southern African Development Community
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SAFEO	Southern African Federation of Engineering Organisations
SAQA	South African Qualifications Authority
WA	Washington Accord

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BACKGROUND

Figure 1 defines the documents that comprise the Engineering Council of South Africa (ECSA) system for accreditation of programmes that meet the educational requirements for Professional Categories. The illustration also locates the current document.

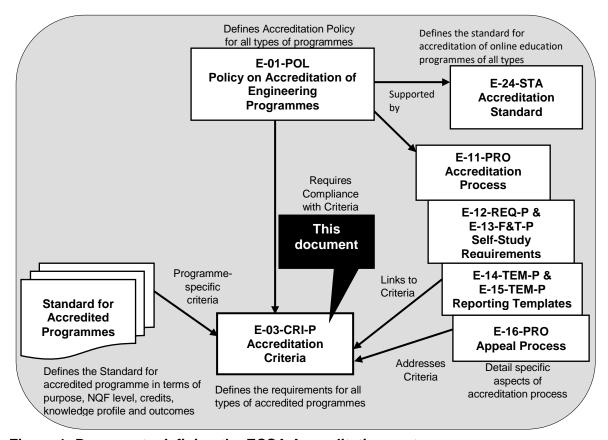


Figure 1: Documents defining the ECSA Accreditation system

1. POLICY STATEMENT

The ECSA develops and operates a quality assurance system that leads to the accreditation of a number of engineering educational programmes.

2. PURPOSE OF THIS DOCUMENT

This document defines the criteria for accrediting engineering programmes. The criteria are as follows:

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- BSc(Eng) / BEng programmes, combination of BEng Tech, PGDip Eng Tech, MEng and a combination of BEng Tech, BEng Tech (Hons) and MEng meeting Stage 1 requirements towards registration as a Professional Engineer and registration as a Candidate Engineer
- BTech / BEng Tech / Adv Dip Eng programmes, meeting Stage 1 requirements towards registration as a Professional Engineering Technologist and registration as a Candidate Engineering Technologist
- ND / Dip Eng / Adv Cert Eng Tech / Adv Cert Eng / Dip Eng Tech programmes, meeting Stage 1 requirements towards registration as a Professional Engineering Technician and registration as a Candidate Engineering Technician

These criteria for programme accreditation are generic and are applied to the different qualifications by means of reference to the relevant standard, norm and code or by peer judgement. The standards that are applicable to each type of programme are identified in Schedule 1.

Accreditation criteria are defined for the three stages in the lifecycle of a programme: planning; students at halfway point; and producing graduates. The criteria that must be satisfied by an existing programme that has produced a cohort of graduates are defined in Section 3. Section 4 defines the requirements of a previously implemented programme that has not yet produced graduates but has students who have completed half of the credits towards the qualification. Section 5 defines the manner in which the criteria are applied to a proposed new programme. Proposed and developing programmes must be planned to meet the accreditation criteria.

3. CRITERIA FOR ACCREDITATION OF PROGRAMMES THAT HAVE PRODUCED COHORTS OF GRADUATES

3.1 Criterion 1: Credits, knowledge profile and coherent design

The programme must be planned and must demonstrate the primary purpose of meeting the educational requirements for an identified engineering role:

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- The total credits specified in the relevant standards
- A knowledge profile defined in the relevant standard
- A coherent core appropriate to the purpose of the programme defined in the relevant standard
- The specialist study as required in the relevant standard
- Designation (qualifier) consistent with the purpose of the programme and the content of engineering sciences
- Explicit rules of combination and progression
- Explicit horizontal and vertical articulation options

The relevant standards referred to in Criteria 1 and Criteria 2 are listed in Schedule 1.

3.2 Criterion 2: Assessment of graduate attributes

The assessment process within the programme must

- ensure that all graduates satisfy each graduate attribute defined in the relevant standard; and
- use a documented set of assessment criteria and processes that together demonstrate that the outcomes are satisfied at the level indicated by the range statement.

Note: Providers are accorded flexibility in using either the set of exemplary assessment criteria in the relevant standard, if any, or an alternative and fully documented set that demonstrates achievement of each of the learning outcomes at the specified level.

3.3 Criterion 3: Quality of teaching and learning

The programme must provide an effective teaching and learning process towards achievement of the outcomes that is evidenced by the following:

 The content, learning objectives, expected outcomes and method of assessment for each module of the programme are defined and documented and are available to staff and students.

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- For each graduate attribute, the information provided in the point above clarifies the
 modules in which exit-level assessment takes place, the method of assessing the
 graduate attributes, the level of achievement required of the students and the
 consequence for the student of not satisfying the exit-level outcome or graduate
 attribute.
- The teaching and learning strategy and methodology is designed to achieve the outcomes of the programme with students who meet the stated admission criteria.
- Suitable learning opportunities are provided to facilitate the acquisition of knowledge and skills specified in the programme outcomes.
- The programme is effectively co-ordinated.
- The learning process encourages independent learning attitudes and abilities, and an appropriate mix and balance between different teaching and learning methods is maintained to encourage the active participation of students in the teaching and learning process.
- The learning progress of students is appropriately monitored and where necessary, academic development support is provided to students through structured and monitored interventions.
- Assessment practices and procedures provide feedback to students at regular intervals.
- An internal process including moderation ensures that all forms of summative assessment of student performance within the programme are effective, fair and rigorous and address the stated learning objectives and outcomes.
- Exit-level assessment is subject to external moderation.
- The teaching and learning process is monitored by an effective quality assurance process that supports continuous improvement.
- Student retention and throughput rates are monitored, and measures are taken to identify and address the factors that adversely affect overall throughput and the throughput of distinct groups.
- Where work-based learning is required for credit towards the qualification, the academic provider ensures that learning is executed effectively and includes the following:

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- The learning objectives and outcomes to be achieved are defined and accepted by the workplace provider.
- Effective placement of students in the workplace and ongoing communication take place.
- Suitably qualified mentors who are technically competent in the discipline and the art of mentoring are available in the workplace.
- Students are mentored in the workplace, and their performance is monitored and recorded in relation to objectives.
- The student's performance and competence are assessed through a rigorous process; this assessment is the responsibility of the academic provider.
- Quality assurance of work-based learning processes by the academic provider ensures achievement of stipulated objectives.

Note: The graduate attributes defined for the qualification include those of work-based learning where applicable.

3.4 Criterion 4: Resourcing and sustainability of the programme

The programme must be adequately planned, resourced, led and executed to ensure that it is sustainable over the period of accreditation. This is evidenced by the following:

- The level of selection of students is commensurate with the programme's academic requirements.
- The number of students admitted is guided by the capacity of the programme to offer good quality education and to meet professional requirements.
- The selection and admission of students is linked to the institution's equity and diversity plans.
- The staff members responsible for leadership and the planning and management of assessment at the exit-level are professionally and technically competent in the respective disciplines. Registration with the ECSA in the appropriate Professional Category provides the norm for professional standing.
- A strategy for recruitment, development and retention of academic staff is in place and is aligned with the diversity plan of the institution.

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- The academic staff responsible for the programme are suitably qualified, have assessment competence and possess sufficient and relevant knowledge and teaching experience.
- The number of academic and support staff is sufficient for the programme.
- The academic staff members have the range of specialities and abilities to teach at the fundamental and specialist levels that are required by the programme.
- Staff members have research profiles relevant to the programme (see Schedule 2: Research criteria).
- Appropriate research development opportunities and programmes for staff members that are consistent with Schedule 2 are in place.
- The allocation of funds and necessary resources to the school or department where
 the programme is located and the appropriate utilisation of these resources by the
 school or department form part of the institutional planning and quality assurance
 processes.
- Budgetary allocations for the programme are adequate and are effectively utilised:
 - Staffing budgets and resulting packages
 - Laboratory equipment
 - Computing and networking
 - Operating expenses
 - Library facilities
 - Work-based learning where applicable
- Office, teaching and laboratory space and equipment are adequate.
- Studies on the effectiveness of the programme in meeting its objectives are undertaken at regular intervals. The results are used to improve programme design, delivery and resourcing and for staff development and student support where necessary.
- Where academic development programmes for students are either offered or are associated with the programme:
 - o the programmes are designed to match the students' state of preparation and progression towards the main programme;

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- staff responsible for the academic development programmes are adequately qualified, experienced and skilled;
- funding for the programmes is adequate;
- realistic criteria are applied for acceptance of students into the academic development programmes; and
- o the academic development programmes are quality assured.

Note: Academic development programmes may present in various forms: foundational, that is, before entry into the main programme or extended, that is, integrated with the main programme.

3.5 Criterion 5: Response to previously identified deficiencies and concerns, capacity for improvement and programme review

In the case of deficiencies and concerns identified during the previous accreditation, such deficiencies and concerns must be adequately addressed.

4. CRITERIA FOR PROVISIONAL ACCREDITATION OF DEVELOPING PROGRAMMES THAT HAVE NOT YET PRODUCED A COHORT OF GRADUATES

These criteria apply to programmes that have not yet produced a cohort of graduates but have students who have achieved at least one-half of the academic credits for the programme

To be granted provisional accreditation, the programme must

- satisfy Criterion 1 as demonstrated by the implemented programme and documented by the programme not yet implemented;
- present a detailed assessment plan that demonstrates how the programme intends to satisfy Criterion 2;

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- present evidence of teaching and learning effectiveness against the sub-criteria of Criterion 3 that is (i) drawn from the part of the programme already implemented; and (ii) in the form of a plan for achieving effective teaching and learning for the remainder of the programme;
- present evidence of adequate resourcing and sustainability of the programme against the sub-criteria of Criterion 4. In particular, the resources (once-off and ongoing) that are already available, committed and requested for the programme against the sub-criteria of Criterion 4 must be adequate; and
- demonstrate the effectiveness of measures taken to address concerns raised during the Initial Evaluation as in the third item of the list below.

5. CRITERIA FOR NEW PROGRAMMES SUBMITTED FOR INITIAL EVALUATION

The terms Initial Evaluation and Desktop Evaluation are defined in document E-O1-POL,

An Initial Evaluation of a new programme considers the extent to which the programme

- satisfies Criterion 1 as judged from a fully detailed proposed programme;
- presents a detailed assessment plan that demonstrates how the programme intends to satisfy Criterion 2;
- presents a detailed plan for achieving teaching and learning effectiveness against the sub-criteria of Criterion 3; and
- presents evidence of planning and institutional commitment to the programme against the sub-criteria of Criterion 4 and provides resources for both the start-up of the programme and on an ongoing basis.

6. CRITERIA FOR PROGRAMMES SUBMITTED FOR DESKTOP EVALUATION

A programme submitted for Desktop Evaluation is judged against criteria 1 to 4 and Criterion 5 if a resubmission is under consideration.

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7. SCHEDULES

Schedule 1: Standards applicable to programmes accredited by ECSA

Programmes leading to:	Standard	Purpose and pathway		
BSc(Eng) / BEng	E-02-PE	Meets educational requirements for Engineer Registration		
Combination of BEng (Tech), PGDip Eng Tech and MEng		Meets educational requirements for Engineer Registration		
Combination of BEng Tech, BEng Tech (Hons) and MEng		Meets educational requirements for Engineer Registration		
BEng Tech	E-02-PT	Meets requirements for Technologist Registration		
BTech	E-02-PT (old)	Meets requirements for Technologist Registration		
Combination of Dip Eng and Adv Dip Eng	E-05-PT E-02-PN	Meets educational requirements for Technologist Registration		
Dip Eng	E-02-PN	Meets educational requirements for Technician Registration		
Dip Eng Technology	E-08-PN E-21-PN	Requires additional Work Integrated Learning for Technician Registration		
Combination of Adv Cert and High Cert		Requires prior Higher Certificate and additional Work Integrated Learning for Technician Registration		
Higher Cert E-07-PN/SC		Level 5 qualification for proceeding to Advanced Certificate or articulating into Diploma or Diploma in Engineering Technology		

Schedule 2: Research criteria

Programmes leading to:	Staff Resea	arc	h Achieveme	ent	Benchm	narks		
BSc(Eng) / BEng	According Guidelines	to	Department	of	Higher	Education	and	Training
BTech, B(Eng) Tech	According Guidelines	to	Department	of	Higher	Education	and	Training
National Diploma, Certificate	According Guidelines	to	Department	of	Higher	Education	and	Training

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REVISION HISTORY

Revision	Revision Date	Revision Details	Approved By		
Number					
Draft 1	15 Oct 1999	Initial draft	Accreditation Policy Working Group		
Draft 2	28 Nov 2005	First working group revision	Accreditation Policy Working Group		
Rev. 0:	16 Feb 2006	Second working group revision	Accreditation Policy		
Concept A		Assigned provisional S&P number	Working Group		
Rev. 0:	22 Feb 2006		Accreditation Policy		
Concept B			Working Group		
Rev. 0:	22 May 2006	Comments of CHE incorporated	Accreditation Policy		
Concept C			Working Group		
Rev. 0:	22 Aug 2006	Editorial changes; new document	Accreditation Policy		
Concept D		identifier	Working Group		
Rev. 0: Draft A	30 Oct 2006	Minor editorial changes; converted	Accreditation Policy		
		to draft status for referral to EPAC and TPAC.	Working Group		
Rev. 0: Draft B	30 Nov 2006	Reordered sub-criteria into logical groups	EPAC		
Rev. 0: Draft C	24 May 2007	Moved reference to HEQC criteria	Accreditation Policy		
		to the appendix	Working Group		
Rev. 2: Draft A	22 Apr 2014	See marginal notes for changes	EPAC Working Group		
Rev. 2: Draft B	3 June 2012	Incorporated changes resulting from consultations with deans and ESGB incorporated EPAC			
Rev. 2	31 July 2014		Approved by Council		
Rev. 3: Draft A	12 Feb 2018	Minor corrections made to incorporate new programmes	Working Group		
Rev. 3	22 May 2018	Approval	PDSGC		
Rev. 4 Draft A	28 Sept 2020	Re-align E-series documents	Working Group		
Rev. 4 Draft B	01 Oct 2020	Review by Education Business Unit	Education BU		
Rev. 4	02 Oct 2020	Review by the Executive RPS Executive: E			
Rev. 4	15 Oct 2020	Approval	RPSC		

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Revision 4 dated 15 October 2020 and consisting of 19 pages has been reviewed for adequacy by the Business Unit Manager and is approved by the Executive: Research Policy and Standards (RPS).

Business Unit Manager

Executive: RPS

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This definitive version of this policy is available on our website.

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Appendix A: Consistency of Graduate Attributes with Critical Cross-Field Outcomes

SAQA Critical Cross-Field Outcomes	Equivalent Graduate Attributes
Identifying and solving problems in which responses display that responsible decisions using critical thinking have been made.	GA 1, 2, 3, 5
Working effectively with others as a member of a team, group, organisation and community.	GA 8
Organising and managing oneself and one's activities responsibly and effectively.	GA 8, GA11
Collecting, analysing, organising and critically evaluating information.	GA 1, 3, 5
Communicating effectively using visual, mathematical and/or language skills.	GA 2, 6
Using science and technology effectively and critically, showing responsibility toward the environment and health of others.	GA 2, 3, 4, 5, 7
Demonstrating an understanding of the world as a set of Related systems by recognizing that problem contexts do not exist in isolation.	GA 1, 3,
Contributing to the full personal development of each learner and the social and economic development of society at large, by making it an underlying intention of the programme of learning to make an individual aware of:	
reflecting on and exploring a variety of strategies to more effectively learn	GA 9
participating as responsible citizens in the life of national and global communities local	GA 10
 being culturally and aesthetically sensitive across a of contexts range 	GA 7
exploring education and career opportunities	GA 8
Developing entrepreneurial opportunities	GA 3