ENSURING THE

EXPERTISE TO GROW

SOUTH AFRICA

**Standard for Accreditation of Online Programmes**

**E-24-STA**

**REVISION No. 0: 10 February 2021**

E C S A

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**DEFINITION OF TERMS (Adapted from the E-01-POL)**

**Academic support:** A process that provides additional learning support to students who are not prepared for the normal curriculum; academic support may be provided prior to or in addition to the normal curriculum.

**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.

**Accredited programme:** A programme that has been evaluated and recognised by the ECSA as meeting the stated criteria.

**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 that indicates a person meets a specified outcome at the required level.

**Blended / Hybrid programme:** Programme offered by the judicious combination of face-to-face interactions and digital classes.

**Category:** A mode of registration defined in or under the Engineering Profession Act, 2000 (Act No. 46 of 2000), that has a distinctive purpose, characteristic competencies, educational requirements and defined principal routes to registration.

**Continuous quality improvement:** A process based on the concept that improvement of a process is always possible, subject to on-going assessment of the process and measures to maintain and improve quality.

**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.

**Course-level objectives:** Description of the skills, knowledge and behaviours to be learnt, and which students can demonstrate if they have achieved mastery of the intended

outcome.

**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.

**Dublin Accord:** is specifically focused on the mutual recognition of academic programmes/qualifications that underpin the educational base for Engineering Technicians.

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

**Engineering education provider:** A public or private higher education institution or body that conducts programmes leading to accredited ECSA engineering qualifications of any type.

**E-learning:** A learning system based on formalised teaching but employing electronic resources such as computers and the internet.

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

**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 is not in the employ of the provider, has made no input into the programme and has no prior contact with the students.

**Face-to-face (contact) programme:** Programme offered where lecturers and students share the same physical space during the learning process.

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

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

**Blended / Hybrid programme:** Programme offered by the judicious combination of face-to-face interactions and digital classes.

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

**Instructional Material:** Collection of materials including animate and inanimate objects and human and non-human resources that a teacher may use in teaching and learning situations to help achieve desired learning objectives.

**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.

**Invigilation software:** The authentication and assessment of students (often done remotely) so that the education provider can be assured and continuing academic integrity is maintained.

**Knowledge profile:** A description of the knowledge of a graduate in terms of the type and balance of knowledge in defined areas.

**Learning objectives:** Statements that define the expected goal of a curriculum, course, lesson or activity in terms of demonstrable skills or knowledge that will be acquired by a student as a result of instruction.

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

**Mathematical sciences:** An umbrella term embracing the techniques of mathematics, numerical analysis, statistics and aspects of computer science cast in appropriate Applied Mathematics.

**Module:** Synonymous with course.

**Multimedia:** A combination of multiple media formats in which text, audio, still images, animation, video and interactivity are used together.

**Natural sciences (formerly basic sciences**): Sciences that comprise physics (including mechanics), chemistry, Earth sciences and the biological sciences that focus on understanding the physical world as applicable in each engineering disciplinary context.

**Notional hours:** The estimated learning time taken by the 'average' student to achieve the specified learning outcomes of the course-unit or programme.

**Online programme:** Education programme offered over any virtual network, predominantly the internet.

**Plagiarism:** A type of cheating that involves the use of another person's ideas, words, design, art, music, etc. as one's own in whole or in part without acknowledging the author or obtaining his or her permission.

**Programme:** A structured, integrated teaching and learning arrangement with a defined purpose and pathway that leads to a qualification.

**Prerequisite knowledge:** Knowledge or understanding that is required before attempting to learn or understand something new.

**Provider:** A higher education provider except if the context indicates otherwise.

**Qualification:** The formal recognition of a specified learning achievement that is usually awarded upon successful completion of a programme.

**Regular Accreditation:** Accreditation according to the accreditation cycle.

**Remote Laboratory:** Remote labs are equivalent to the traditional lab environment in using

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real equipment connected to a computer, but situated at a significant distance from learner.

**Rubric:** An evaluation tool or set of guidelines used to promote the consistent application of learning expectations, learning objectives and learning standards in the classroom or to measure their attainment against a consistent set of criteria.

**Stage 1:** A point in the process of professional or occupational development in engineering at which a person fulfils the educational requirements to register as a candidate in the relevant category.

**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:** is an International Agreement between bodies responsible for accrediting engineering technology academic programmes.

**The Act:** The Engineering Profession Act, 2000 (Act No. 46 of 2000).

**Virtual Laboratory:** virtual labs generally comprise simulation software running as a host machine distant from the user. Parental and expensive servers are often required to make the simulation as realistic as possible.

**Washington Accord:** is an international accreditation agreement for undergraduate professional engineering academic degrees between the bodies responsible for accreditation in its signatory countries and regions.

## ABBREVIATIONS

| ECSA | Engineering Council of South Africa |
|---|---|
| ICT | Information and Communication Technology |
| IEA | International Engineering Alliance |
| HODs | Heads of Departments |
| LMS | Learning Management System |
| NQF | National Qualifications Framework |

## BACKGROUND

Figure 1 defines the documents regarding the system of the Engineering Council of South Africa (ECSA) for the accreditation of Programmes that meet the educational requirements of the 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. The standards, criteria, policies and procedures that define the accreditation system are presented in this set of documents.

The accreditation system assures the public, students, employers, funders and other stakeholders that (i) the programme fulfils its key purpose of providing the graduate

with the educational foundation for engineering in a stated role at the professional level; and (ii) the teaching, learning and assessment processes are effective.

## 2. APPLICABLE LEGISLATIVE FRAMEWORK

Programme Quality Assurance is required under the Higher Education Act, 1997 (Act No. 101 of 1997) as amended, and the Engineering Profession Act, 2000 (Act No. 46 of 2000) (hereafter referred to as "The Act"), and empowers the ECSA to conduct accreditation to evaluate educational programmes. The Act also determines the maximum interval allowed between such evaluations. The Act empowers the ECSA to grant accreditation with or without conditions attached, to withdraw accreditation and to refuse accreditation.

Accreditation of a programme signifies that the programme complies with the criteria regarding the educational requirements for registration in the Candidate or Professional in the corresponding category. Accreditation, in this context applies to the accreditation of engineering programmes and not to a department, school, faculty or education institution.

## 3. NATIONAL AND INTERNATIONAL COMPLIANCE

Graduates of accredited programmes will practise in a globalised environment, even if they work locally. With globalisation, local standards and practices converge to international norms. The accreditation system is, therefore committed to international benchmarking of the standards and accreditation processes against the Graduate Attributes of the International Engineering Alliance (IEA) and the IEA's best practices. Criteria 1 and 2 are, therefore, designed to be substantially equivalent to the Graduate Attributes of the relevant accords. Criteria 3 and 4, and the accreditation process follow the IEA's best practices.
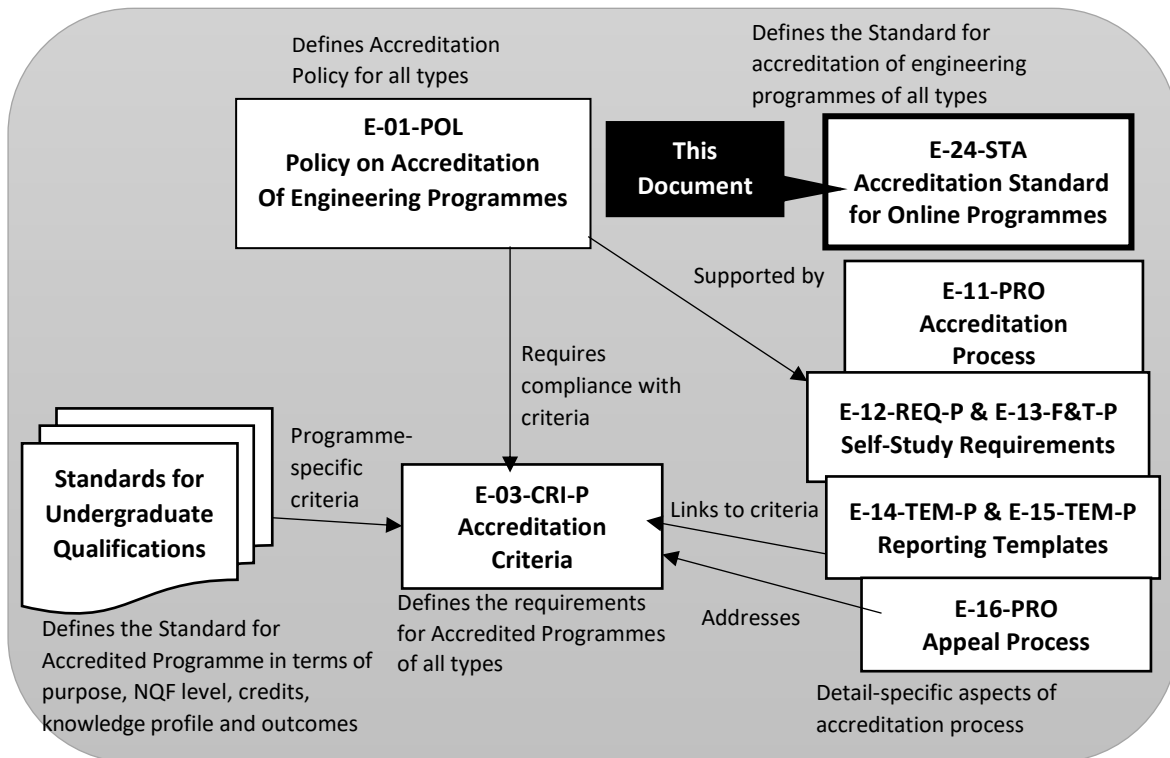
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**Table 1: Educational Accords of the International Engineering Alliance**

| Accords | Types of Engineering Programme |
|---|---|
| Washington Accord | Qualifications for Engineers |
| Sydney Accord | Qualifications for Engineering Technologist |
| Dublin Accord | Qualifications for Engineering Technician |

**Note:** ECSA is a signatory of all the three accords.


## 4. PURPOSE OF THIS DOCUMENT

This document defines the standards that are to be met by the engineering education provider in the design and delivery of online programmes in order to meet the Stage 1 requirements towards registration in the Candidate or Professional Categories of the ECSA.

The accreditation criteria for programmes 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 ECSA suite of education policies extensively covers the requirements and accreditation criteria of the engineering programmes that are offered in a face-to-face (contact) fashion at the physical campuses of the engineering education provider. Although most of the provisions of the existing policies also apply to online programmes, the latter present different challenges related to their accreditation. This Standard document highlights the additional requirements of online programmes to meet the ECSA accreditation criteria described in the **E-03-CRI-P** policy.


## 5. RELATED DOCUMENTS

The interrelationship between the various Education Policies, Standards, Processes and Procedure documents are provided in Figure 1.

Document **E-01-POL** lists all applicable documents relating to the Standards for the various Engineering Programmes.

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# 6. RECORDS AND DOCUMENTATION TO BE SUBMITTED FOR ACCREDITATION OF ONLINE PROGRAMMES

The ECSA requires the engineering education provider to submit self-study documentation and onsite documentation as indicated in documents **E-11-PRO** and **E-12-REQ-P**. An electronic submission of all documents is required.

## 6.1 Specific elements of evidence required for accreditation of online programmes

1. The additional requirements for accreditation of online programmes should be presented as read only documents in a properly indexed file system on a virtual platform that is accessible to the team. Provision should be made for the team to have access.

2. Students' scripts selected from the relevant programme and service courses must be available before and during the accreditation.

3. Course material supplied to current students or expected to be obtained by students: tutorial sheets, videos, instruction sheets for laboratory experiments, prescribed texts, notes, computer programmes, codes, etc.

4. Assessment materials for each course, including test papers, assignments and project statements, examination question papers with specimen solutions (memoranda) for the last three years.

5. Marked examination, project and assignment scripts of all courses/modules for the most recent year (The number of scripts to be presented is the smaller of the number in the class or the number 15).

6. A selection of the best, the average and just passed/failed students' scripts at each level and in each course.

7. Examples of final-year design and/or laboratory/investigational projects for the most recent year that are representative of the range of sub-disciplines in the programme of good, average and just passed/failed students (The number of reports to be presented is the smaller of the number in the class or the number 15)

8. Information on the times that students may access the remote and virtual laboratories, the IT facilities of the engineering educational providers and other resources.

9. Access to individual students' academic records on request.

10. The CVs of the department's academic staff (These may be full CVs or two-page summaries. The CVs of service-course staff are not required; their details are summarised in Academic Staff Teaching in the Programme and the Service Department Staff table in document **E-13-F&T-P**).

11. Documentation on the internal quality assurance process, including sample paper trails for selected courses and all exit-level courses.

12. Documentation on the moderation process (internal and external), including the moderators' high-level reports for the most recent examination.

## 7. APPLICATION OF ACCREDITATION CRITERIA IN THE CONTEXT OF ONLINE PROGRAMMES

Online programmes must meet all the accreditation criteria specified in document **E-03-CRI-P (Revision No.4)** and the additional elements included below.

### 7.1   Criterion 1: Credits, knowledge profile and coherent design

No additional elements required.

### 7.2   Criterion 2: Assessment of Graduate Attributes

No additional elements required.

### 7.3   Criterion 3: Quality of online teaching and learning

- All online material should be available to students via a stable and effective network communication connection.

- The dedicated Learning Management System (LMS) employed for consistent online teaching and learning should make provision for consultation, asynchronous and synchronous collaboration and communication, and feedback.

- The employed LMS should make provision for virtual simulation and work-integrated learning where required.

- The multipliers used for the calculation of credits should account for asynchronous interaction with the learning material.

- The virtual contact in a synchronous lecturing mode should be clearly specified in

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document **E-03-CRI-P** and ideally, should be verifiable through the timetable, learner guide and LMS records.

- The learning progress of students should be appropriately monitored to identify student success, students at risk and vulnerable students. Where necessary, academic development support must be provided to students through structured and monitored online interventions.

- The method of assessment for each module of the online programme must be defined and documented in order to achieve and ensure assessment integrity.

- Method of identity verification for each student must be defined and documented to ensure assessment integrity.

- Where the method of assessment makes use of continuous evaluation, the engineering education provider must ensure that the complexity is at the correct NQF level and that the evaluation can be externally moderated.

- The Assessment of Graduate Attributes may be conducted online. The engineering education provider must demonstrate the integrity of the online assessment.
  **Note:** Engineering education providers are accorded flexibility in the use of either the set of exemplary assessment criteria in the relevant Standard or an alternative and fully documented set that demonstrates achievement of each of the learning outcomes at the specified level.

- Institutional assistance with computer literacy for students should be provided where required.

- Institutional intervention for students with data availability and internet access should be provided where necessary.

- The academic staff responsible for the programme must be IT literate and competent to offer the programme using the LMS and Proctoring software available at the engineering education provider.

- The evidence of the online interaction between students and academic staff should be provided.

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### 7.4    Criterion 4: Resourcing and sustainability of the online programme

The additional elements that need to be achieved and the required evidence are listed below:

- Suitable Information and Communication Technology (ICT) infrastructure must be available. Detail what has been provided in respect of the following:
  - Computing
  - Networking
  - Security and integrity
  - Software
  - Licences
  - Suitability
  - Invigilation
  - Maintenance
- Budgetary allocations, capital and maintenance for the programme are adequate and are effectively used:
  - Computing
  - Networking
  - Software
  - Licences
  - Update and replacement of ICT components
  - Maintenance

## 8.  LOGISTICAL REQUIREMENTS DURING REMOTE ACCREDITATION OF ONLINE PROGRAMMES

The following logistical requirements need to be in place in order to conduct accreditation remotely. It is the responsibility of the ECSA and the engineering education provider to ensure that stable and effective communication is provided.

1. Access to the internet through a fast and reliable internet connection (e.g. Fibre or 4G/5G) by all Accreditation Team members.
2. Education provider should ensure an easy access at all times to IT support for

ECSA teams in case of drop outs or difficulties in the use of education provider software.

3. Access by the Accreditation Team to all online teaching platforms (LMS such as Blackboard, Moodle, Kahoot, Sakai) used by the engineering education provider.

4. Suitable video conferencing or communication software (e.g. MS Teams) and associated computer network to enable stable communication between the team members, the engineering education provider and the students as necessary.

5. Members of the Accreditation Team must be able to communicate remotely with the Dean and the Heads of Departments (HODs) at all times. The remaining staff are to be available as far as possible for remote interview purposes.

6. The institution must provide a live on-line video and pre-recorded evidence of the activities that need to be demonstrated as part of the accreditation.

7. If applicable, laboratories/workshops must provide a live video tour of students in action in the laboratories, preferably allowing participation between the students, laboratory technicians, staff and team members, in addition to pre-recorded evidence showing the layout of equipment in the laboratory or workshop.

## REVISION HISTORY

| Revision Number | Revision Date | Revision Details | Approved By |
|---|---|---|---|
| Rev. 0: Draft A | 18 Aug 2020 | First Draft | Consultant |
| Rev. 0 Draft B | 21 Nov 2020 | Final draft reviewed by the Working Group | Working Group |
| Rev. 0: Draft C | 28 Nov 202 | Review and inputs | Education BU |
| Rev. 0: Draft D | 5 Dec 2020 | Review by the Executive & Deans Forum consultation | RPS Executive |
| Rev. 0: Draft E | 25 Jan 2021 | Inputs from Deans Forum reviewed by the Working Group | Working Group |
| Rev. 0: Draft F | 28 Jan 2021 | Final draft review by the Executive | RPS Executive |
| Rev. 0 | 10 Feb 2021 | Approval | RPSC |

The Standard for:

**Accreditation of Online Programmes**

Revision 0 dated 10 February 2021 and consisting of 17 pages has been reviewed for adequacy by the Business Unit Manager and is approved by the Executive: Research Policy and Standards **(RPS).**

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Business Unit Manager

11/02/2021

Date

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Executive: **RPS**

11/02/2021

Date

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